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Rail Modernisation as Export Aid

MR. IAIN MACLEOD, Secretary of State for the Colonies, had some pertinent remarks to make on the value of the railway modernisation schemes to the export trade of the country when he attended a luncheon to celebrate the inauguration by Sir Brian Robertson of the North East London electric passenger services last week. Mr. Macleod was one of several M.P.s whose constituencies will be served by the electric services, who attended the luncheon given by Maj.-General G. N. Russell, Chairman, and Members of the Eastern Area Board, but it was in his capacity as Secretary of State for the Colonies that he drew attention to the excellent opportunity which the success of the railway electrification projects, in particular, afforded for promoting British trade in overseas territories. He emphasised that an efficient transport system was essential in the development of any country, and that railways with their bulk-carrying capacity must have priority if full advantage was to be taken of indigenous resources, and trade and industry given its full opportunity to expand. Mr. Macleod had in mind the less developed Colonial territories, but the same arguments may be advanced with equal force

to a wider range of countries. The resourcefulness of the British manufacturers, in co-operation with the British Transport Commission, in making possible the most up-to-date technical advances in traction equipment, demonstrated to the world that the skill, quality, and technical "know-how" of this country remain as high as ever. The willingness of British manufacturers and of the B.T.C. to accept trainee visits from overseas should be a powerful aid in the promotion of export business. Mr. Macleod did not specifically mention the excellent work which is being done by the United Kingdom Railway Advisory Service, but obviously this was one of the methods that he had in mind. In much that he said at the luncheon, the Minister was speaking to the converted, but it was encouraging to have so forthright a statement from a member of the Cabinet. If Mr. Macleod would make his point equally well to some of his Government colleagues, some practical help to railway equipment exporters might be forthcoming. Extended credits to back up the technical quality and knowledge which they possess would enable them to regain many valuable but highly competitive markets.

Perpetual Motion

HARD on the heels of the news that London bus, tube, and rail fares are to be increased is the announcement that the railway unions are pressing on the London Transport Executive the claims initiated earlier this year for a shorter working week for about 14,000 Underground staff. This development is interesting in view of a letter we publish this week, and on which we comment editorially elsewhere in this section. Our correspondent draws attention to a conviction which apparently is shared by railwaymen and travelling public alike that each is antagonistic to the other. It is in this atmosphere that the unions are pressing for conditions which automatically result in higher earnings for their members, and it also is in this atmosphere that the London Transport Executive has swiftly stated that, at this stage, it cannot concede to those demands. The Executive cannot be accused of obstructive behaviour in this matter: if any adjustment in hours is made, it is the Executive which must wheedle more money from the public.

The Late Mr. C. G. G. Dandridge

THE death at the age of 71 of Mr. C. G. G. Dandridge, former Passenger Manager, Southern Area, and Advertising Manager of the L.N.E.R., not only severs another link with pre-grouping days but brings a reminder of the times when it was considered essential for a railway advertising officer to have a practical knowledge of the product he was pledged to sell. Beginning his career in 1905 on the Great Central Railway, Mr. Dandridge trained in both Commercial and Operating departments and gained experience of railway difficulties in Russia and Turkey before returning after the 1914-18 war to Manchester and, later, to London. This experience undoubtedly was of value when the Railway Clearing House Advertising & Public Relations Committee initiated the "Square-Deal" campaign so successfully conducted during 1938, the third and last year of his chairmanship of that committee. In 1945, having meanwhile added the duties of Assistant Passenger Manager to his responsibilities, he became Passenger Manager of the Southern Area of the L.N.E.R. He finished his railway career as Chief Commercial Manager of the Eastern Region of British Railways.

Level Crossings in Germany

REDUCED expenditure in the operation of level crossings is one of the aims of recent developments on the German State Railways. Measures taken to this end are referred to in the paper entitled "The development and application of new methods of signal engineering in Germany," read by Dip.-Ing. K. F. Kümmell of the German State Railways before the Institution of Railway Signal Engineers on November 9. Of the 18,000 level crossings in existence on the German Railways, all those on lines where train speeds exceed 60 km.p.h. have to be equipped with barriers, and the operating cost is considerable. A flashing-light system is used where minor single tracks cross main roads to give a 30 sec. warning of the approach of trains. This is augmented on double-track lines by a half-barrier to hold road traffic when a second train approaches

the crossing in the opposite direction after the passage of the first train. At minor roads the half-barrier is replaced by an illuminated sign giving warning of the approach of two trains. Use of this type of equipment will be considerably extended.

East African Railways Finances

THE draft estimates of revenue and expenditure for 1960 and 1961 of the East African Railways & Harbours show a rather disappointing position. After a steady rise in 1958 and 1959, revenue in 1960 has been only slightly above last year's level, and it is expected that the final account will show a position approximately the same as last year's reasonably satisfactory result. For 1960 it is expected that railway earnings will reach £19,800,000 compared with the original estimate of £20,000,000 and £19,514,470 earned in 1959. Ordinary working expenditure is now estimated at £14,270,436 compared with the original estimate of £14,403,609 and £13,909,785 expenditure in 1959. The 1961 estimates are based on earnings increasing by 2.02 per cent above the revised 1960 level, and it is expected that ordinary working expenditure will increase by 1.96 per cent. During 1960 the accent has been on consolidation and in 1961 this essential work will be continued so that the services are kept fully adequate for the needs of East Africa.

Negligence in Fog

AS Colonel Reed's report, summarised on page 633, makes clear, there is no mystery about the collision in thick fog, on April 1, 1960, at Herne Hill sorting sidings in the Southern Region, British Railways. The local yard pilot engine had drawn a goods train with its own locomotive back along the down line from Camberwell. The pilot engine was detached, and the train was taken by its engine across on to the up line, and then into the up sidings. The former engine remained on the down line, to go into the down sidings. The signalman forgot about this last engine, improperly "keyed out" on his Sykes instrument, and then accepted and signalled through a down electric passenger train. Meanwhile, the driver and fireman of the pilot engine had failed to carry out Rule 55 thoroughly and expeditiously, so that the signalman was not reminded in time of the presence of this engine. Colonel Reed makes no recommendations. He says that as matters stand, safety here, even in fog, is ensured if the men concerned do not neglect their duties.

Fuel Cells for Transport

WIDESPREAD application of the fuel cell to certain forms of transport during the next decade is forecast in the publication "Fuel Cells: Power for the Future" recently issued by the Fuel Cell Research Associates of Cambridge, Mass., U.S.A. This consists of a report on a prolonged investigation which contains an economic and technical analysis of developments and opportunities in the field of electrochemical fuel cells. Various types of fuel cell are under development and, with fuels such as hydrogen and propane, efficiencies of conversion from chemical to electrical energy of from 50 to 85 per cent have been obtained. Among the types of transport which at present are considered amenable to fuel cell technique may be mentioned industrial and delivery trucks, taxis, tugs and ferries, and, when a more advanced stage has been reached, the possibility of using the fuel cell for locomotives is suggested. At present the hydrogen and oxygen cell is the most practical type which has been evolved, but to make the fuel cell commercially attractive on a large scale, research is being conducted in the use of less expensive fuels, such as propane and ethane.

Electric Services in N.E. London

A FURTHER issue of *Electrification News* has appeared at the same time as the North East London electrification scheme has been put into operation on the Great Eastern Line, Eastern Region. Introduction of the electric trains working to the old steam train timings a week in advance of the inauguration of the full electric service is explained, enabling some early experience to be gained on these routes. Some warning is given of a certain amount of teething troubles which are likely to be encountered at the commencement of a

scheme which contains so many new, and, in some cases, highly original, features in its equipment. Some alterations are considered to be inevitable in the light of service experience to ensure the provision of a first-class service. The opening of this electrification scheme is seen as a major step forward in the modernisation plan, but at the same time it forms the completion of just one stage in a planned series. Also under consideration is electrification of the Lee Valley and Cambridge lines.

British Railways Vindicated

WE are taking the unusual course of devoting an editorial in answer to one of our correspondents this week because we wish to underline the progress made by British Railways, and because the letter concerned—from Mr. C. J. Gregg of the International Railways of Central America—reflects views widely held by the general public. They also are views widely held by visitors from the Americas, who are very apt to compare the cleanliness of trains in a highly-industrialised and congested island possessing a labour force averse to, and able to refuse, arduous and dirty work with that of countries where wide open spaces separate smoke-laden atmospheres, where a clean form of traction is in general use, where mechanisation is highly developed, and where there is a plentiful labour market which, having performed domestic service for generations, is expert in that work and largely resigned to staying in it. American critics should remember also that the service they probably have nostalgically in mind is given on payment of a substantial surcharge on an already heavy fare over an extremely long distance.

Listing staff grievances, Mr. Gregg rather oddly omits reference to the Guillebaud report published two months before his visit began. The implementation of this report, the aim of which—to ensure fair wages for British railwaymen—has been accepted by the Government, will remove most if not all his informants' complaints. We cannot help wondering whether Mr. Gregg has read our columns as faithfully as his letter would have us suppose, for we constantly review schemes produced by British Railways to improve relations between management and men. To encourage and maintain contact between all grades is an important function of all the railway public relations departments: internal public relations officers work to ensure a close-knit organisation.

The letter resurrects that hoary public resentment which no amount of explanation or rational argument seems able to efface: "Why can't we have fast trains like they have on the Continent?" This desire will admit no understanding of the effects on a congested timetable of even one or two exceptionally fast trains, effects which would be most loudly decried by the very individuals who press hardest for their causes. To hark back to pre-war timings merely begs the question—the pattern of traffic has completely changed since 1939. Other criticisms include cases of bad riding—these are receiving detailed attention from Commission and private manufacturers concerned; old stock—surely Mr. Gregg must realise that this is scheduled for replacement? Unpunctuality—our correspondent cannot accept the fact that modernisation around bottlenecks arising on the most intensely-worked railway system in the world must produce some disruption; lack of explanation in cases of delay—he apparently found no evidence of the drive, the success of which is even admitted by the British public, to give this information quickly and courteously; off-hand treatment of potential freight shippers and over-centralisation of freight-handling—here we draw attention to the rises in all classes of British Railways freight traffic detailed elsewhere in this section, and to the new organisations set up by each of the Regions to decentralise the freight structure and give greater autonomy at district level.

In comparing unfavourably the present nationalised system with the competitive railways of the past, Mr. Gregg is on firmer ground, though the Great Central services to which he refers probably never were "economically justified." Products of a highly-competitive era, they were attractive to the user, but no dividend was paid on the deferred ordinary stock after 1889 (the year a 100-mile stretch south of Annesley was opened), and preference stock also suffered heavily. The functional increase in Metropolitan Railway running time on the Harrow line probably results partly from greater density of traffic, and partly from the exchange stop at Finchley Road for the Bakerloo tube extension. This stop was not built until 1939.

British Transport Commission Traffic Receipts

SMALL but encouraging increases over Period 10 have occurred in all branches of the British Transport Commission's freight activities during Period 11, the four weeks ended November 6, and in only one case do the new figures show a drop compared with the corresponding period last year. Carrying of merchandise and livestock, which brought in £8,672,000 in Period 11 of 1959, amounted to £8,630,000 during the four weeks ended November 6 this year, a drop of £42,000, or approximately $\frac{1}{2}$ per cent down on the 1959 figure. Nevertheless, these carryings show a rise over those for the previous month, an interesting result in view of the adverse publicity which, sometimes even by individuals who might be expected to support the railways, is constantly being showered on British Railways ability to handle this type of traffic efficiently. Taken in consideration with the general steady up-trend evident in the following table, this result gives heartening support to official railway statements that the installation of modern equipment and facilities, together with the introduction of more efficient methods of operation, is at last beginning to show tangible results.

| | Four weeks to | | Incr. or decr. | Aggregate for 44 weeks to | | Incr. or decr. |
|---|------------------------|------------------------|----------------|---------------------------|------------------------|----------------|
| | Nov. 6, 1960 £000's | Nov. 1, 1959 £000's | | Nov. 6, 1960 £000's | Nov. 1, 1959 £000's | |
| Passengers— | | | | | | |
| British Railways ... | 10,303 | 9,512 | + 791 | 129,600 | 120,368 | + 9,232 |
| London Transport— | | | | | | |
| Road passenger services ... | 4,374 | 4,328 | + 46 | 48,045 | 46,379 | + 1,666 |
| Railways ... | 2,178 | 1,923 | + 255 | 21,997 | 20,004 | + 1,993 |
| Provincial & Scottish buses ... | 4,551 | 4,398 | + 153 | 53,009 | 52,254 | + 755 |
| Ships ... | 262 | 294 | - 32 | 6,723 | 6,994 | - 271 |
| Total passengers ... | 21,668 | 20,455 | +1,213 | 259,374 | 245,999 | +13,375 |
| Freight, Parcels & Mails | | | | | | |
| British Railways— | | | | | | |
| *Merchandise & livestock ... | 8,630 | 8,672 | - 42 | 86,249 | 83,965 | + 2,284 |
| *Minerals ... | 4,139 | 3,889 | + 250 | 41,423 | 37,032 | + 4,391 |
| *Coal & Coke ... | 9,403 | 8,679 | + 724 | 90,887 | 91,422 | - 535 |
| *Parcels, etc., by coaching train ... | 4,532 | 4,370 | + 162 | 47,307 | 45,513 | + 1,794 |
| *Total freight, British Railways ... | 26,704 | 25,610 | +1,094 | 265,866 | 257,932 | + 7,934 |
| Others† ... | 4,786 | 4,608 | + 178 | 48,803 | 46,741 | + 2,062 |
| Total freight, parcels & mails ... | 31,490 | 30,218 | +1,272 | 314,669 | 304,673 | + 9,996 |
| Total ... | 53,158 | 50,673 | +2,485 | 574,043 | 550,672 | +23,371 |

*Includes receipts from collection and delivery, etc., and from railway freight traffic within Commission-owned dock areas.
†Inland waterways freight, road haulage, and ships.

With the exception of the shipping results, which can be expected to fall at this time of the year, passenger receipts also reflect the impact of modernisation, although higher fares have played their part, too. Increases are shown under all heads—significant increases in the cases of British Railways and the London Transport Executive. Here, again, these results are especially interesting when viewed in the light of the changes now taking place throughout the system under modernisation. Streamlining of services, including the closure of unremunerative lines, has been carried out despite howls of protest from the areas affected, but this has been done in close integration with the Commission's road services. The figures contained in the table above show that the results are proving beneficial to rail and bus services alike.

It is an ill wind which blows nobody any good, as a butcher is reported to have claimed this week in an area hit by the short-time working in the motor-car industry. Until recently, large numbers of his potential customers ate out in restaurants: now they tended to buy their food from him and eat it at home. Similarly, a widespread difficulty in meeting hire-purchase payments may well result in a substantial increase in railway passenger traffic, particularly at a time when this has become more attractive through the introduction of modern stock on better track through bright, new stations. The public is never too blasé to be drawn by a novelty, as was shown by the mass of people which crowded the trains of the Glasgow suburban electrification during the first few days of its opening. Once introduced to the improved facilities now available on British Railways, passengers can be induced to return if given efficient

and courteous service: occurring at the same time as a change-over in the pattern of national spending, this process could be accelerated by the astute and determined railwayman.

PERCENTAGE VARIATION 1960 COMPARED WITH 1959

| British Railways: | Four weeks to 44 weeks to | |
|---|---------------------------|--------------|
| | November 6 | November 6 |
| Passengers ... | + 8.3 | + 7.6 |
| Parcels ... | + 3.7 | + 3.9 |
| Merchandise & Livestock ... | - 0.4 | + 2.7 |
| Minerals ... | + 6.4 | + 11.8 |
| Coal & Coke ... | + 8.3 | - 0.5 |
| Total ... | + 5.3 | + 4.5 |
| Ships (passenger) ... | - 10.8 | - 3.8 |
| British Road Services, Inland Waterways & Ships (cargo) ... | + 3.9 | + 4.4 |
| Road Passenger Transport, Provincial & Scottish ... | + 3.4 | + 1.4 |
| London Transport: | | |
| Railways ... | + 13.2 | + 9.9 |
| Road services ... | + 1.0 | + 3.5 |
| Total ... | + 4.8 | + 5.5 |
| Aggregate ... | + 4.9 | + 4.2 |

Great Eastern Electrification Timetable

ONE of the most interesting features of the new Great Eastern Line electric service out of Liverpool Street, British Railways, Eastern Region, that came into operation on November 21, is that it brings into use once again, and now as an important trunk route, a line which (apart from a brief revival during the 1914-18 war) has been closed to passenger traffic for the past 51 years. This is the Southbury (former Churchbury) loop from Bury Street Junction on the Enfield Town Branch to Cheshunt, the route now being taken by the electric trains between Liverpool Street, Broxbourne, Hertford and Bishops Stortford.

During off-peak hr. these run at 30-min. intervals, and during peak hr. every 20 min., non-stop between Liverpool Street and Lower Edmonton in 15 min., as compared with the previous 30 min. by stopping trains. The electric trains then call at all stations and divide at Broxbourne, reaching Hertford East in 52 min., as against 68-73 min. by stopping trains hitherto, and Bishops Stortford in 56 min.; up trains take 53 and 58 min. respectively. The Sunday service is at 30 min. intervals throughout the day.

Connecting with these trains at Cheshunt is an even-interval diesel multiple-unit service, at 20-min. intervals in the peak hr., and at 60-min. intervals during the off-peak hr. from and to Liverpool Street via Hackney Downs, Tottenham, and the main line; this is supplemented by a diesel service between Stratford, Tottenham, and Cheshunt, at 40-min. intervals in the peak hr. and each 2 hr. in the off-peak hr.

Throughout the off-peak hr. both Enfield Town and Chingford have six trains per hr., as compared with the previous 30-min. interval service. The Enfield trains take 25-29 min. as against the present 39 min., and the Chingford trains 23-24 min. as against 37 min.; the shorter times in each case are of trains which omit certain intermediate stops. During the peak hr. the Enfield trains continue at 10 min. intervals, but the Chingford service expands to nine trains per hr., six of them non-stop between Liverpool Street and St. James Street, Walthamstow. An interesting feature is the revival of the former G.E.R. all-night Chingford service at 60-min. intervals. On Sundays, four trains per hr. are run throughout the day between Liverpool Street and both Enfield Town and Chingford.

The Cambridge main line times are completely systematised, and the cutting-out of the recovery times for the electrification work, the shortening of stops, and faster running, result in considerable accelerations. To Cambridge there are hourly fast trains from 8.36 a.m. to 7.36 p.m. inclusive (except at 11.36 a.m., 1.36 and 3.36 p.m.), and at 20-min. intervals during the peak period from 4.36 to 5.56 p.m. Up in the morning there are five trains from Cambridge between 7.40 and 9 a.m., and then-expresses at 2-hr. intervals from 10.40 a.m. to 2.40 p.m., followed by the 3.40, 4.40 and 6.40 p.m. All these call at Bishops Stortford and Audley End and take 72 min. down and 77 min. up, except the 4.36 p.m. "Fenman" (which omits Bishops Stortford going down and takes 68 min. and is non-stop up at 8.48 a.m. in the same time), and the 9.36 a.m. down and 3.40 p.m. up, which call at Harlow Town instead of Bishops Stortford. The new Harlow Town Station has non-stop trains

to Liverpool Street at 7.40, 8.0 and 8.20 a.m. and 4.24 p.m., and from Liverpool Street at 4.20 and 9.36 a.m., 5.14, 5.34 and 5.54 p.m.

The six Cambridge expresses which continue to and from Kings Lynn benefit considerably by acceleration. Their average journey time between London and Kings Lynn is reduced from 2 hr. 40 min. to 2 hr. 19 min., and the up journey comes down from an average of 2 hr. 39 min. to 2 hr. 22 min. By the connecting diesel trains, Hunstanton is now slightly within 3 hr. of Liverpool Street by several trains daily. Other connecting services by diesel multiple-units which are on an even-interval basis are those between Ely and Norwich, Cambridge, Newmarket, Bury St. Edmunds and Ipswich, and Cambridge, St. Ives and March, all at 2-hr. intervals, with certain additions at peak hr., and the rail-bus service between Audley End, Saffron Walden and Bartlow.

Refrigeration on Rail

ALTHOUGH it is often assumed that mechanical refrigeration must represent a technical advance over the use of water ice as a means of cooling insulated railway freight vehicles, this is not necessarily true for all types of food cargo in transit except in the case of long trans-continental journeys passing through extremes of climate. Mr. T. A. Eames of British Railways Research Department (Engineering Division), Derby, who delivered his paper, "Refrigerated transport on railways," before a meeting in London last week of the Institution of Locomotive Engineers, believes that the choice between any number of refrigeration systems which meet the basic performance requirements should depend on a number of important factors. These include considerations of reliability, and the cost, weight, and size of the equipment used, the possibility of control, and flexibility in meeting different service conditions.

The application to rail transport of mechanical refrigeration with the use of a compressor, which is the most thermodynamically efficient way of producing cold conditions artificially, has only developed to any considerable extent in the United States. By 1956, 2,366 mechanical refrigerator vans were in service there compared with 125,000 water ice vans, whereas in the European countries covered by Interfrigo and associated companies the corresponding figures in 1959 were nine and 13,193 respectively. The number of mechanical refrigerator vans in the United States is increasing very rapidly and the impetus would appear to have come chiefly from the rapid growth of the frozen food industry which demands temperatures in transit below freezing point. This requirement cannot be met by the use of water ice which is more suitable for fresh produce such as fish, fruit, and vegetables. The capital cost of a mechanically refrigerated van with its plant is high and this will be easier to justify where journeys permit continuous use of the plant for long periods of time. But experience in the United States has shown that, in addition to routine maintenance between journeys, about one unit in five requires some minor attention to prevent failure of the refrigeration process during a two weeks trans-continental journey. Failures are becoming less frequent and are divided roughly equally between the driving unit, which usually is a 34-h.p. 25-kW. diesel generator set, and the compressor and condenser unit. Mr. Eames comments that this is a real source of weakness as compared with refrigeration by water ice or dry-ice. If complete failure were to pass undetected the result would indeed be serious. Perhaps the greatest advantages of mechanical refrigeration is the ease of control it affords to meet varying conditions.

Short journeys with more intermittent use of refrigeration facilities would tend to favour the dry-ice (solid carbon dioxide) method which is considered to be the only serious competitor to mechanical refrigeration. Cardice and Drinkold solid carbon dioxide supplies are available in all parts of Britain. The temperature is minus 109°F. at atmospheric pressures, which makes it suitable for all classes of frozen traffic, and the latent heat is 275 B.T.U. per lb. which is about twice that of water ice. The equipment required for its use is very simple which tends to offset the comparatively high price of this refrigerant, the most commonly used of all for rail transport.

In choosing an insulating material from the many available particular attention is needed to the phenomenon of water-vapour transfer and condensation. This not only lowers the

efficiency of the insulation but can be a source of much damage to the surrounding structure and lining materials. To emphasise the magnitude of the problem in practice Mr. Eames quotes the results obtained from tests at the Washington Bureau of Standards on an insulated trailer. With an interior temperature of 0°F. and ambient air temperature of 110°F. and 60 per cent relative humidity, during 71 days the increase in weight due to moisture accumulation was 770 lb. and up to 4 in. of ice had built up on the glass-fibre insulation. The rate of heat leakage into the vehicle increased by about 7 per cent. In another example quoted, refrigerator vans in Canada have been reported to gain between 1,000 and 2,000 lb. during their first few years in service after which they could only maintain 50°F. difference in temperature compared with 65°F. on works test. In Mr. Eames's experience the insulating substances most resistant to these processes are the foamed plastic materials with closed cell construction, but even with these, transfer is still possible through unsealed cracks; correct application is as important as selection of the material in minimising condensation. One practice in North America to combat the problem is to have the innermost lining of the refrigerator van formed by a continuous metal sheet separated from the insulated wall proper by an air space through which the cold air circulates. This enables the cold side of the insulated wall to comply with general recommendations in being permeable to allow water which passes through the vapour barrier to be picked up by the air in the space and deposited as frost on the refrigeration plant. At the same time there is no conflict with the requirement of a hard cleanable hygienic surface for the inner lining.

Although in this country the mild climate and short journeys have been influential in causing a lag in the application of refrigeration for the transportation of fresh fruit and vegetables, competition with frozen or refrigerated fresh products from abroad could well stimulate a demand for improved quality in the home product. Mr. Eames contends that the problem is not one of transport facilities alone, but of correct handling at all stages. The first requirement would seem to be pre-cooling on or near to the farms, and the practicability of supplying it is a question of cost. If pre-cooling were associated with a rail transport service it might take the form of mobile units which could pre-cool the fruit when loaded in the van or container.

Letters to the Editor

(The Editor is not responsible for opinions of correspondents)

British Railways Attacked

November 9

SIR,—I follow with great interest the fluctuating fortunes of British Railways as reported in your columns, and in particular the complaints and criticism ventilated in letters to the Editor.

During my last home leave in May and June of this year, I had many opportunities to ride railways in Italy, France, and Great Britain. Without hesitation, I can affirm that British Railways were pre-eminent for dilapidation, filth, slow schedules, unpunctuality, and discourtesy.

On Sunday, May 1, 1960, I travelled by the 9.30 a.m. from Queen Street, Glasgow, to Kings Cross. I chose that route because I remembered the excellent service on the former Great Northern Railway before nationalisation, and recommended it to some American fellow travellers.

The first class coach had not been cleaned, the dining car was filthy with one of the large windows badly cracked and half covered by wide strips of brown paper pasted over the glass, and the food unpalatable. The dining car crew, however, gave excellent service and their courtesy and cheerfulness was most welcome.

This train was delayed about 1½ hr. because of engineering work, but no notification was made to passengers until the train had left Newcastle, although it must have been known to the station staff at Glasgow.

The comments of my American friends were not complimentary to British Railways and my subsequent trips over the Southern, Western, and London Midland Regions did little to offset the unfavourable impression made on myself.

I agree with Mr. Douglas Gray, your correspondent of September 17, that the diesel units give uncomfortable riding, but if he wished to touch the nadir of filth and appalling riding qualities he should ride in one of the box compartment-type electric trains of the Metropolitan Railway between Baker Street and Harrow-on-the-Hill, or visit the Harrow & Wealdstone Station of the London Midland Region.

I travelled on the French and Italian railways from Paris to Rome and Naples and return, from Carcassonne to Paris and between Paris and Victoria. The sleeping and dining equipment between Paris and Rome and Carcassonne and Paris was spotlessly clean, the food excellent, and both the French and Italian staff pleasant and courteous to the public. The only criticism I could justly make is that the modern diesel equipment between Rome and Naples is noisy and does not ride as smoothly as the normal electric passenger equipment in Italy.

The running in France and Italy was much faster than in England and all of the trains I was on arrived on time, which was not the case with British Railways.

On British Railways, the coaching stock was uniformly dirty outside and not properly cleaned inside. Twice there was no soap and no towels in the toilet compartment and toilet bowls had neither been cleaned nor disinfected.

Too often, booking-office and station staff, while not actively discourteous, were indifferent and seemed to regard the travelling public as a pest to be tolerated, an attitude not confined to British Railways among nationalised industries in Great Britain.

I asked several employees of British Railways why railwaymen seemed so disgruntled. The principal reasons for low morale seemed to be an aloof management brought about by over-centralisation, and that individual merit and efforts have no effect on promotion, that the average scale of pay is below that of industry in general, that pensions are so low that no man can retire without taking a job to supplement his pension, that pay differentials did not fairly represent the difference in responsibility, that some departments were grossly overstaffed, while others were badly undermanned, and a feeling that the public were antagonistic towards nationalised undertakings and the people working for them.

My own experiences as a passenger had not made me sympathetic toward British Railways, but I thought I should get the reaction of shippers to British Railways' freight service. Several had abandoned British Railways because, whereas road services gave them individual attention, British Railways maintained a take-it-or-leave-it attitude. British Railways' freight service was regarded as less satisfactory than road services, because pilferage was greater, transit times slower, and delivery dates uncertain.

WAITING FOR BUSINESS

It was strongly felt that road services went to the potential client, while British Railways wait for the client to come to them. As one shipper said: "You have to sell transport just as keenly, if not with greater keenness, than any other product. British Railways do a very poor job of selling railway service to shippers. They have become so centralised and removed from our local problems that they are no longer capable of serving us with the same efficiency as their independent, decentralised competitors. Formerly, my requirements were served by the Great Western and Southern Railways. Both were interested in getting my tonnage and competed keenly. Now, we have only British Railways and the absence of the former competition has been reflected in loss of interest in my problems. They seem to believe they have the monopoly and need not bother about the shipper. I now give all my freight to the road services and will continue to do so until British Railways can again look on me as an individual with individual problems."

The suspicion of some railway employees that the public regarded the railways and other nationalised undertakings and those working for them with hostility seemed to be borne out, when I talked with people about their reactions to the difficult situation of British Railways and the heavy operating deficits incurred.

Many of them were ill-informed, but all objected strongly to taxation for funds to meet the deficits and what they termed astronomical expenditures for modernisation, which most thought were being dribbled away with no visible results.

They also strongly objected to being mulcted by the Government to maintain, and provide more, roads which they said

were used by private shippers with "C" licences and road services for hire to private financial advantage at taxpayers' expense, as neither holders of "C" licences nor common carriers paid their fair share of the cost of road construction nor for damage caused by operation of heavy vehicles.

They felt that the more they were mulcted in these ways the more business was taken away from the railways and the larger became the deficit the taxpayer was forced to meet. They most strongly objected to "C" licence holders, road services, and bus and coach operators being permitted to profit financially at the expense of their fellow citizens.

It was several times suggested that "C" licence holders ought to pay a user tax of 4d. per ton-mile, road services 2d. per ton-mile, and inter-city bus and coach undertakings 1d. per passenger-mile in addition to the taxes they now pay.

CUMBERSOME ORGANISATION

In regard to British Railways, most of my friends believed that the present organisation is so large and cumbersome that efficient and economical operation is impossible. It was suggested that British Railways should be cut up into smaller, completely independent, undertakings and that the various managements should be made personally responsible for operating their system profitably, competing with each other and with road services, but co-operating in matters such as through passenger and freight services.

As one man put it, when the London & North Western was competing with the Great Western, the Midland, and the Great Northern, the public benefited by the strenuous efforts each railway made to provide efficient, fast, and convenient service to attract and hold its fair share of the available traffic, but, since British Railways took over, service has deteriorated until it is only a pale shadow of its former self.

To those of us old enough to remember the magnificent railway services of pre-grouping and inter-war periods, the present service given by British Railways appears as a national disgrace. The excuse usually handed out is wartime wear-and-tear and dislocation caused by modernisation, but neither of these reasons can excuse failures to provide reasonably clean coaching stock, well-maintained and clean locomotives, and services even as fast on an average, and operated by coaching stock as smooth and comfortable as those of 30 or 40 years ago.

Travel by coach is cheaper, cleaner, and at least as comfortable as second class rail travel. British Railways pride themselves on not having increased fares in the same proportion as prices in general, but they are unable or unwilling to provide passenger service for second class passengers at prices competitive with coach fares. It is cheaper, or at least it was in May and June this year, to travel by coach and air between London and Paris than second class by rail and steamer.

In spite of all the publicity about economies on British Railways, much unremunerative and unnecessary service is still running with no hope of even meeting operating expenses, while other services, economically justified, have disappeared.

As examples of uneconomic service, take the passenger service between Evercreech Junction and Glastonbury, or the lavish, but completely unjustified, service on the LTE between Baker Street and Aylesbury, Watford, and Uxbridge between 10 a.m. and 4 p.m. and after 7 p.m. at night.

If you wish for an example of uneconomical capital expenditure, take the quadrupling of the line of the old Metropolitan Railway north of Harrow-on-the-Hill. There is no possibility that this measure will increase traffic sufficiently to produce sufficient net revenue to pay for the interest on the additional capital expenditure. It is another example of the burden placed on the British taxpayer for the benefit of a few thousand season ticket holders, who will not appreciate it, as they are still disgruntled at the last increase in suburban passenger fares.

Economically-justifiable services which have disappeared were the excellent express services formerly run by the Great Central Railway from Marylebone to Rugby, Leicester, Nottingham, Sheffield, Manchester, and South Yorkshire. These services gave the only direct railway connections between Harrow, High Wycombe, Princes Risborough, Aylesbury, and other districts and the Midlands and South Yorkshire. While the Great Central services were not the fastest, yet they commanded an appreciable regular patronage, because the service was both convenient and comfortable. It began to deteriorate when the old Great Central was grouped with the L.N.E.,

but on my last leave I noticed the services had completely disappeared.

Similarly, British Railways are operating steam service out of Marylebone as far north as Nottingham, but running times are slower than they were 30 years ago, at least between Aylesbury, Harrow and Marylebone. The L.T.E. is doing no better, because I travelled back in the 1920's between Harrow and Baker Street on the old Metropolitan faster than it could be done in May, 1960.

You may consider that I am another example of an elderly Colonel Blimp, viewing the past through rose-tinted spectacles, but I believe you will find that many men of my generation will agree with most of the comments I have made.

I also am firmly convinced that Mr. Samuel Pepys was right when he wrote: "I see that the King cannot get things done as cheap as other men," and I am sure he would agree that nationalised public services mean a deterioration in the quality of the services rendered, a rapid and steep increase in charges for such services, disgruntled employees, and a dissatisfied public, which can obtain no remedy against its grievances, because all Government Departments regard any protest, no matter how justified, as damned insolence and rarely fail to let their fellow citizens understand that point of view.

Yours faithfully,

CHARLES JOHN GREGG

International Railways of Central America,
Guatemala, C.A.

Outlook for American Railroads

November 19

SIR,—Data since to hand do not show any marked improvement in the American railroad situation as described in your November 11 issue. There was no upsurge in October wagon loadings. For 43 weeks to November 5 these were 86,050, or 0.3 per cent, above 1959 and 732,220, nearly 3 per cent, above the poor year 1958. Coal and ore moved more freely, though steel plants worked at little more than half capacity. The movement of grain and timber declined. The volume of general merchandise improved slightly, but the sharp fall in less-than-wagon-load traffic continued. In 1948 the railroads originated nearly half a million wagon loads of smalls and in 1959 only 2,114,600, a fall of over 60 per cent. Circumstances have changed completely since forwardings of less than five-ton consignments occupied 13,245,000 wagons in 1927.

For the first time since February, freight revenue was up \$37 million, or 5.7 per cent, but passenger revenue was down 3 per cent, mail receipts by 8 per cent and parcels revenue by 14 per cent.

In August, operating expenses were \$17 million, nearly 3 per cent higher, but over eight months of this year the total was cut by \$77 million, or 1.5 per cent, while taxes of all kinds were reduced by \$9 million, or 1.3 per cent. The upshot was a drop in earnings (before charges) of \$104 million, or 20.6 per cent, at August 31. Twenty companies were then in deficit, five more than a year ago. The New Haven was short of \$10.4 million and would have closed down if the Interstate Commerce Commission had not approved a substantial loan to it, which presumably the local authorities will redeem by reducing taxes on the railway's property in 1961.

Yours faithfully,

YOUR CORRESPONDENT

Westminster, S.W.1

Pullman Services

November 18

SIR,—As manufacturers of the equalised Commonwealth cast-steel bogie with outside swinghanger suspension of the bolster for passenger vehicles, we believe we are contributing a bogie to British Railways which gives a very satisfactory ride, and probably the best obtainable over an extended period between wheel turnings compared with any other bogie now employed by British Railways.

We question therefore the statement made by Mr. Rodgers in his letter addressed to you on November 4, that the new locomotive-hauled "Master Cutler" Pullman train, having Commonwealth bogies, can be said to be fitted with "inferior bogies" as compared with the bogies on the high-speed Pullman trains. While these trains have been subjected to criticisms

in the press, there has been no criticism either by Press or passengers (there have only been complimentary remarks), about the ride of the "Master Cutler" Pullman; electronic "ride-recording" instruments also show the excellent ride performance of these Pullman cars. We can only suggest that Mr. Rodgers has not experienced the ride on this train but is making a comparison without proper personal experience.

Mr. Rodgers refers to an excess weight due to the use of Commonwealth bogies, but we would prefer to refer to "extra" weight, which is not denied. In our opinion, in considering the design of a bogie one must consider the effectiveness of it and whether it gives the public a good ride; we think the matter of weight is only one of many factors which has to be considered as to whether the design of bogie is worth while or not.

We understand that the difference in weight attributable to the use of Commonwealth bogies is 3 ton 7 cwt. and not 5 ton per vehicle. This difference in weight is partly because of design features, such as equaliser beams, and partly because the bogies are made of cast steel, which eliminates the maintenance of welded and riveted joints and gives an indefinite life, but is slightly heavier being cast in thicknesses greater than usual for rolled sections due to foundry requirements.

British Railways is looking for bogies that give the greatest comfort to the travelling public, and at the same time are not costly to maintain. Commonwealth bogies now run under sleeping cars, main-line passenger cars, and Pullmans; we suggest Mr. Rodgers might like to travel on any of these vehicles, and then decide whether British Railways have made a wise choice or not in having these Commonwealth bogies.

Yours faithfully,

C. J. DADSWELL,
Managing Director

English Steel Castings Corporation Limited,
River Don Works,
Sheffield, 9

Vertical Curves

November 11

SIR,—As regards Mr. N. J. B. Alexander's question as to why the radius of a curve at sag should be twice as that at a summit, it may be mentioned that the radius is not kept twice at the sag, but the rate of change of grade is twice in the case of a sag as that at a summit.

Wellington has exhaustively treated this subject in his classical book on Railway Location. Briefly, in the case of a sag the couplings are in compression and change suddenly to tension as the train leaves the sag. This used to cause snapping of couplings (which were very weak in former times), and consequently parting of trains resulting in serious accidents. In the case of a summit the couplings remain in tension and the only change that occurs is in temporary increase in tension which, if too abrupt and large, may be undesirable or even dangerous.

Wellington's analysis indicates that there will be no crowding if the rate of change of grade is kept at 0.025 per cent in sags, which gives a very long and costly vertical curve; if the rate of change of grade is maintained at 0.05 per cent, danger will be averted. This analysis is based upon a train length of 1,200 ft., and the grade of repose of the last vehicle as 0.3 per cent. As there is no similar danger at a summit, the rate of change of grade at the summit is doubled. This gives a parabolic vertical curve easy to calculate and lay and serves the purpose of a transition.

There is some doubt about the correctness of his analysis as it entails a smaller rate of change of grade (i.e., longer vertical curve) for slow trains and larger rate (i.e., shorter curves) for high-speed trains, which is contrary to what it should be in practice. The A.R.E.A. while accepting the same rate of change of grades as recommended by Wellington for high-speed main lines have permitted, therefore, higher values of rate of change of grade for branch lines with lesser speeds.

These are personal views.

Yours faithfully,

S. A. DESAI,
Vice-Principal

Advanced Permanent Way Training School,
Government of India, Ministry of Railways,
Poona, 1

THE SCRAP HEAP

The Last Straw

The morning rush-hour has reached a new peak on the 7.13 a.m. Reading-London train, which has been stopped five times in the last month by the weight of the crowd depressing the springs. The pressure has been so great that the automatic stopping device has touched the tracks and activated the brakes.

A Singular Appearance

"What possible object can there be in my remembering that the engine which hauled us from Calais to Paris in 1865 was built by J. Cail of Paris, on the 'Crampton' system; that is, that the axle of the big single driving wheels did not run under the frame of the engine, but passed through the cab immediately under the pressure gauge? In the 'sixties' the express engines on the Nord railway had their bodies entirely encased in polished brass, which gave them a most singular appearance."—Lord Frederic Hamilton in *"The Days Before Yesterday"* (1920)."

Civil Engineers

The railways were built by civil engineers but the idea of the universal benefits of a railway network was also conceived by engineers, who, in the conditions then existing pursued their conception to its fulfilment; they undertook the formation of companies, the raising of the money, the promotion of Bills in Parliament, the purchase of land and property, the works of construction, and even the management of

the completed service. . . . These men were concerned not only with personal achievement or personal gain, but also with a vision of benefit to this country and to their fellow men, and in that age, civil engineers stood very high in the estimation of the public. . . . The names of Telford, Brunel, the Stephenson and many others were almost household words. . . . It is doubtful, today, if an ordinary member of the public could tell you even what a civil engineer does, and well-informed members could hardly name one. The reason is that as a profession we have become immersed in schemes conceived by other people and have forgotten how, or have no time or have lost the inclination, to take the lead, so far as that is possible in modern conditions, in promoting ideas and projects of our own conceiving.—Sir Herbert Manzoni in his Presidential address to the Institution of Civil Engineers.

Mail Van Mystery

To enable two badly damaged 4-ft. 8½-in. gauge mail vans in the Dresden Transport Museum to be restored, the Director, Dr. Ing. S. Matthes, of the Hochschule für Verkehrswesen, Hettnerstrasse 3, Dresden A.27, would be glad of information on their origin, of which he has no record. The vans are painted reddish brown, and bear a monogram which appears to be "VR." Immediately below the cantrail are the remains of lettering decipherable as . . . ESS OVERLAND MAILS. On the frame is painted: "A. W. Robinson Allahabad

1878." The vans are numbered 880 and 883. They are fitted with side buffers and screw couplings, and appear to have been about 30 ft. long overall. VR seems to be the cipher of Queen Victoria. Our guess is that the vans were the property of the British Government, conveying "express overland mails" between Calais or Boulogne and Brindisi or Marseilles. The reference to Allahabad and 1878 is puzzling. The overland rail route through Egypt fell into disuse soon after the opening of the Suez Canal in 1867, and there is no 4-ft. 8½-in. gauge in India.

New Life for a Venerable Line

The Middleton railway, built in 1758 as a wagon-way for coal haulage, has been successfully revived by the Middleton Railway Preservation Society under the direction of Dr. R. F. Yonell, a lecturer in physics at Leeds University. The little railway, on which a steam locomotive was running as early as 1812, is now used for the delivery of freight, consisting mainly of scrap metal and steel plates, from factories to the sidings of British Railways, North Eastern Region. Motive power is supplied by *The John Alcock*, an historic diesel locomotive weighing 28½ tons. The only serious operating difficulty that has been encountered is caused by unsympathetic motorists who force their vehicles round the locomotive while it is crossing the road.

Passengers Booked

American tourist, one of a Stratford-bound party at Paddington, pointing to a notice 'Reading passengers only', commented: "My, aren't their trains cute! Just look at those special compartments for people with books!"—"Peterborough," in *"The Daily Telegraph."*

Grand Tour

A special holiday tour by train will be operated by the South African Railways during the coming December/January holiday season. The train will leave from Johannesburg on December 18. Kimberley, East London, Port Elizabeth, the Wilderness, Knysna, Oudtshoorn, Mossel Bay, Paarl, Cape Town, and Bloemfontein are included in the itinerary. The inclusive fare for adults is £93 10s. This covers first-class travel in saloons fitted with showers and hot and cold water. Passengers will be accommodated three to a compartment and two to a coupé, while a limited number of compartments can be reserved for two persons and coupés for one person at a small extra charge. Entertainment and sight-seeing excursions to places of interest en route will be provided.

Electrification Lament

Oh, Mr. Marples, what shall I do?
I'm electrified from Manchester,
But can't go on from Crewe.

Extend the scheme to London
As quickly as you can,
Or British manufacturers
Will have to take the can.

Chocolate Locomotive



Mr. Larry Larkin, chief confectioner of the Canadian Pacific liner "Empress of Britain," finishing a chocolate locomotive made for the Canadian Pacific Railway 75th anniversary celebrations held aboard the liner on November 7

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

SOUTH AFRICA

Petrol and Oil by Rail

The transport by South African Railways of 14,804,000 gal. of fuel oil in bulk by rail during August was a record, eclipsing the previous highest total of 14,098,000 gal. carried in railway tank wagons during November last year. The port of Durban handled 15,651,000 gal. of petrol and paraffin during August, also a record. The previous best was 15,560,000 gal. during December, 1959.

Training Scheme

Non-white employees of the South African Railways & Harbours are taking part in the most comprehensive training scheme ever introduced in South Africa. The primary objectives of the scheme are to improve the efficiency and productivity of the non-white worker, and to provide a career for non-whites on the railways. Training schools have been established first for non-white supervisors, who are drawn from the better educated workers. By January these schools will be turning out 100 trained Bantu supervisors a month for labourers in harbours and goods yards. Gradually the scheme will be extended to provide specialised training both for supervisors and for each of the 109,000 non-white employees in the service. Concurrent with this training of non-whites, lectures are being given in all parts of the Union to white railway workers on the various laws affecting the Bantu, on Bantu law and custom, and on race relations, and white railway supervisors are strongly encouraged to study Bantu languages.

EAST AFRICA

New and Rebuilt Stock

The Transport Advisory Council has authorised the purchase of 69 units of rolling stock comprising refrigerated

containers, insulated wagons, and brake vans at an estimated cost of £239,000, and the rebuilding of 76 units of rolling stock comprising cattle wagons, brake vans, and caboose coaches at a cost of some £102,250. The purchase of new refrigerated containers and insulated wagons should meet all current and foreseeable demands for the carriage of deep-frozen products, fresh meat, bacon, butter, and so on, bearing in mind the steadily expanding movement of perishable foodstuffs, both imported and locally produced. There has also been a heavy increase in livestock traffic over the last few years, despite an unusually heavy incidence of foot and mouth disease over the first six months of this year. It is therefore proposed to purchase 20 new cattle wagons and to rebuild 25 wagons.

New Station at Kisumu

An additional expenditure of £87,000 has been recommended for the construction of the new passenger station and ancillary facilities at Kisumu. An amount of £25,000 to cover preliminary work was recommended last March. This will be the first stage of a reconstruction scheme for the whole of Kisumu Station and yard which was constructed in 1901.

CEYLON

Air-conditioned Travel

The Government Railway has decided to introduce air-conditioned coaches on the long-distance fast passenger express trains. A commencement was made this month with the operation of a de luxe saloon in daily service between Colombo and Kankasanturai, a return journey of 512 miles. The saloon is heavily insulated against sound and dust. The windows are double-glazed with sliding curtains. The interior décor is in pale cream Formica and the floor covering is in kingfisher

blue. Fluorescent lighting concealed by opal diffuser panels is the principal form of illumination. Armchair type seats on each side of a central gangway are deeply padded with foam-rubber and mounted individually. Each seat has a push-button locking device to enable adjustment from reclining to upright position. The body and the underframe of the coach were built in Ceylon at the Railway's Central Workshops at Ratmalana.

INDIA

Rail Survey Sanctioned

The Railway Board has sanctioned the reconnaissance, engineering, and traffic surveys, for a broad-gauge link from Kathua to Jammu, a distance of some 100 miles. The surveys will be carried out by the Northern Railway Administration. The line would facilitate expeditious movement of goods between the Jammu and Kashmir State and the rest of the country.

NEW ZEALAND

Modernisation at Masterton

A comprehensive scheme for re-arrangement and enlargement of the railway goods yards at Masterton, principal centre of the Wairarapa district, has been announced by Mr. M. Moohan, the Minister of Railways. The scheme includes erection of a new goods shed with loading shelters. The work is estimated to cost £80,000.

VICTORIA

Diesel-Hydraulic Locomotives

Victorian Railways has ordered another 25 diesel-hydraulic "W" class locomotives for shunting and transfer work. Total cost will be just over £1,000,000. These locomotives will eliminate steam working from the lines between Melbourne and Ararat, both via Ballarat and Geelong, and the main Albury-Melbourne line. The department will then be in a position to scrap a further 40 steam locomotives that average 50 years of age. The successful tenderer was Tulloch Limited of Rhodes, New South Wales. This firm is already supplying 25 "W" class locomotives to the Victorian Railways, and 20 have been delivered; the remainder will be at work before the end of the year. First delivery of the new order will be made in March, 1961.

The "W" class locomotives, first to have diesel-hydraulic transmission in the State, weigh 48 tons, develop 650 h.p., and can travel up to 40 m.p.h.

CANADA

Strike Called

Unions representing 111,000 non-operating railway workers across Canada have called a strike for December 3.



Air-conditioned de luxe saloon for the Ceylon Government Railway

The last national railway strike called by the same group of men, workers employed in all sections except the actual operating of trains, took place in 1950, when the five-day 40-hr. week was the major issue. The unions are now seeking a wage increase. An increase of about 14 cents an hr., spread over a two-year agreement, was recommended by a conciliation board, but the railways have refused the recommendation, claiming that they cannot afford it.

UNITED STATES

Fully-Automatic Train

The New York City Transit Authority recently demonstrated its first fully-automatic driverless train, intended for use on the Grand Central-Times Square shuttle service. The demonstration was held between the 18th Avenue and New Utrecht Avenue stations on the Sea Beach line. The equipment enables the doors to close and the train to start and run at a controlled speed to the next station, where it brakes and stops at a pre-determined point, the doors opening automatically as it does so. After a given time, the doors close again and the train travels back to the other end of the line. This programme is controlled from fixed lineside installation by electrical impulses transmitted *via* the running rails. To check the integrity of the track ahead of the train, the impulses are always transmitted

from the point to which the train is travelling and are picked up by receivers mounted ahead of the first pair of wheels. The impulses are decoded by equipment on the train and used to operate relays which control the brakes, motors, doors, and so on, on the three cars.

ITALY

Bridge Across Venice Lagoon

The State Railways has approved the construction of a new bridge across the lagoon connecting Venice with the mainland. It will be built alongside the existing bridge and will take three years to complete. The present bridge will be retained for secondary traffic.

WESTERN GERMANY

Rolling Stock Construction

The German Federal Railways placed into service 208 new passenger coaches and 2,648 freight wagons during the first half of 1960. Another 327 passenger coaches and 3,271 freight wagons have been constructed.

HOLLAND

Troop Train Derailed

A British military train on its way from Western Germany to the Hook of Holland was derailed near Woerden last

Monday. The accident occurred in a section where a new track is under construction, and where there is a speed limit of 25 m.p.h. A British sailor and a German dining-car attendant were killed, and 20 soldiers were injured. One of the 10 coaches overturned down an adjoining dyke and five others toppled over on their sides, one into a ditch.

HUNGARY

Punctuality of Trains

Mr. József Soproni, General Secretary of the Hungarian Railway Workers' Union, addressing the union's annual conference in Budapest recently, stated that more than 97 per cent of Hungarian trains now run to time, compared with 89.6 per cent three years ago. In the same period the quantity of freight carried by the railways had increased by 36 per cent.

U.S.S.R.

Rail Link with China

The 194-mile railway line connecting Aktogai Andav, the Soviet state frontier, with China has been opened for service. This line provides a short cut between Kazakhstan and the Sinkiang-Uighur autonomous region of China where construction work is proceeding to convert the region into an industrial centre.

Publications Received

Climax: An Unusual Steam Locomotive. By Thomas T. Taber III and Walter Casler. Rahway, New Jersey: Railroadians of America, Inc., 761, West Inman Avenue. 11 in. x 8½ in. 97 pp. Illustrated. Price \$6.—The creation in 1888 and development of the Climax gear-transmission steam locomotive for specialised haulage work on rough tracks often constructed entirely of timber is an integral part in the saga of the North American logging and lumber industry. The influence of the Climax on the activities of the industry and some unusual features of its construction as it progressed from a 10-ton design with vertical boiler, to versions of the 12-wheel Class "C" weighing over 100 tons built in the 1920's, are described in considerable detail with many anecdotes concerning the personalities involved. The work includes some 36 pages of Climax locomotive-production and ownership records. For comparison purposes other similar locomotives by Shay, Dunkirk (including Gilbert and Heisler designs), Baldwin, and Price (in New Zealand) also are described with brief histories of some of these builders. The frontispiece is an excellent coloured reproduction of a recent painting by Richard Ward showing the last Climax in logging service in the United States fording a river in West Virginia. The many other illustrations, including prints from original sales literature, have been reproduced by photo-lithography. Some of the diagrams bear key lettering for

which no key is given and two of the captions are misleading as to the correct function of constant-mesh speed-change gearing. This first edition is limited to 2,000 copies.

The Observer's Book of Railway Locomotives of Britain.—Edited and revised by H. C. Casserley: Frederick Warne & Co. Ltd., London and New York. 5½ in. x 3½ in. x ¾ in. 282 pp. Illustrated. Price 5s.—This new edition has been revised and extended and contains the latest information, and technical data of the various classes of locomotives to be seen on British Railways. There is a complete list of every locomotive which is named and revised tables of diesel and electric locomotives. The colour plates have been revised, and there are also many changes in the numerous half-tone illustrations which accompany the descriptions.

T.I. Extended Surface Tube.—This 28-page catalogue describes several forms of extended surface tube suitable for heat-exchange purposes in the oil, chemical, processing, and power-producing industries. Copies may be obtained from Tube Investments Limited, The Adelphi, London, W.C.2.

Philplug Heavy Fixing Devices and Compounds.—Philplug spike-fixing compound for railway sleepers, Expanda bolts, anchor bolts, and stud bolts, also Philplug threaded or plain-bore asbestos-fibre inserts for concrete sleepers, are all described in detail with fixing instructions

in an illustrated leaflet available from the distributors Expandite Limited, Chase Road, London, N.W.10

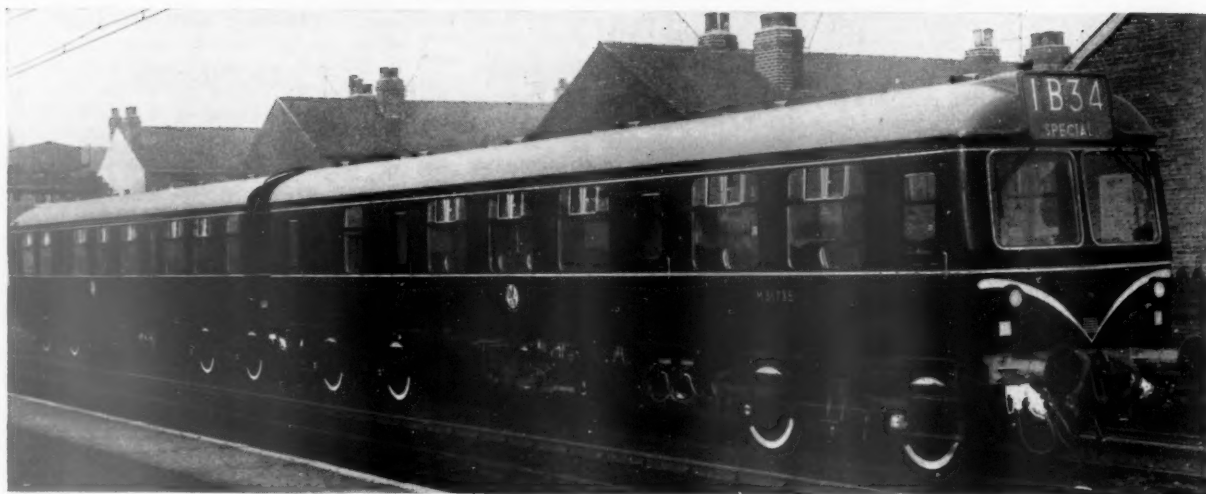
Osmond Cut-off Machines.—A leaflet illustrating and giving performance data for a selection from the extensive range of Osmond sawing and abrasive-wheel cut-off machines of 2-30 h.p. Copies may be obtained from A. & S. Osmond Limited, 13 Dowry Square, Bristol, 8.

Gardner Diesel Engines.—Dimensions and maximum b.h.p. ratings for rail-traction and other duties by Gardner 4LK, 6LX, 6HLX, LW, HLW, and L3 diesel engines are listed in an attractively illustrated leaflet published by Norris, Henty & Gardners Limited, Barton Hall Engine Works, Patricroft, Manchester.

Rails and Rail Accessories.—The sixth edition of this catalogue of railway track materials, published by Thos. W. Ward Limited, contains 32 pages describing the full range of items in general use including crossings and turnouts, rails, chairs, lever boxes, buffers, turntables, and platelayers' tools. The diagrams illustrating standard rail sections and weights and most forms of trackwork, with nomenclatures and tabulated dimensions, should make it invaluable to operators of private railway sidings in standard and narrow gauges. Both new and secondhand rails are offered and there is a useful guide to simplify the ordering of switches and crossings. Copies may be obtained from Thos. W. Ward Limited, Albion Works, Sheffield.

More Diesel Railcars for British Railways

Twin-car sets of steel construction with two engines totalling 476 b.h.p. and hydro-mechanical drive



Craven-built twin-car set each component of which has one Rolls-Royce power unit driving a single axle

RECENT deliveries of diesel railcars to British Railways, London Midland Region, include 25 two-car sets in which each vehicle is powered by one 238 b.h.p. Rolls-Royce eight-cylinder engine and torque-converter transmission. These cars have been built by Cravens Limited, Sheffield. Previous deliveries by this manufacturer include 25 two-car sets fitted with one Rolls-Royce engine per car and mechanical gearbox transmissions, and about 150 two-car and three-car sets with the conventional British United Traction twin-engine units and Wilson (S.C.G.) mechanical transmissions.

Each of the new cars has a driving cab at one end and an inter-connecting gangway at the other. One has first and second class seating and a toilet; the other has second class seating and a luggage compartment. These two cars normally are to operate as a unit, but the control gear has been arranged for operation with other "blue-square" stock, that is, coupled to units comprising cars with Rolls-Royce engines and torque-converter or mechanical transmissions, and B.U.T. engines and mechanical transmissions. Also an intermediate trailer can be inserted in the formation, and good performance retained.

Leading particulars are as follow:—

| | |
|-------------------------------|-----------|
| Weight in working order | |
| Car with luggage compartment | 29.5 tons |
| Composite car | 29 tons |
| Maximum speed | 70 m.p.h. |
| Number of seats, first class | 12 |
| Number of seats, second class | 103 |
| Length over body | ft. in. |
| Bogie centres | 57 6 |
| Bogie wheelbase | 40 0 |
| Wheel dia. | 8 6 |
| | 3 0 |

The gross weight of a two-car set with all seats occupied is about 70 tons and the b.h.p. per ton of fully laden weight is therefore about 6.8.

The controls are arranged to allow

multiple-unit working with mixed stock of up to six power cars. The driver is provided with three controls: a throttle handle for engine-speed control and marked: idling, 1, 2, 3, and full; a drive selector-handle for obtaining drive on torque-converter cars or gears 1 to 4 on gearbox-type cars; and a detachable reversing lever. All controls have electro-pneumatic operation. The fuel-pump racks are controlled by an all-speed C.A.V. governor, which, in turn, is loaded by a pneumatic actuator. An air choke in the supply line gives a time delay to smooth out any jerky operation of the controller.

The deadman device is incorporated in the pivoted throttle handle. When a train consists of cars with both hydraulic and mechanical drive the controller is operated as for mechanical drive. The speedometer dial is marked in segments corresponding to gear-change positions to indicate to the driver when to change gear.

Automatic Change to Direct Drive

On the torque-converter units the change from converter to direct drive is made automatically at about 46 m.p.h. At this speed a voltage signal is passed by the speedo-generator to the relays of a Smiths-Stone lock-out box. During the transition from converter to direct-drive the engines are automatically returned to idling and then speeded up to the appropriate speed for direct-drive at that rail speed. When the train is retarded, converter drive is automatically re-engaged at 39 m.p.h. In this case the engine speed does not drop to idling but is increased to that required for operation of the torque-converter.

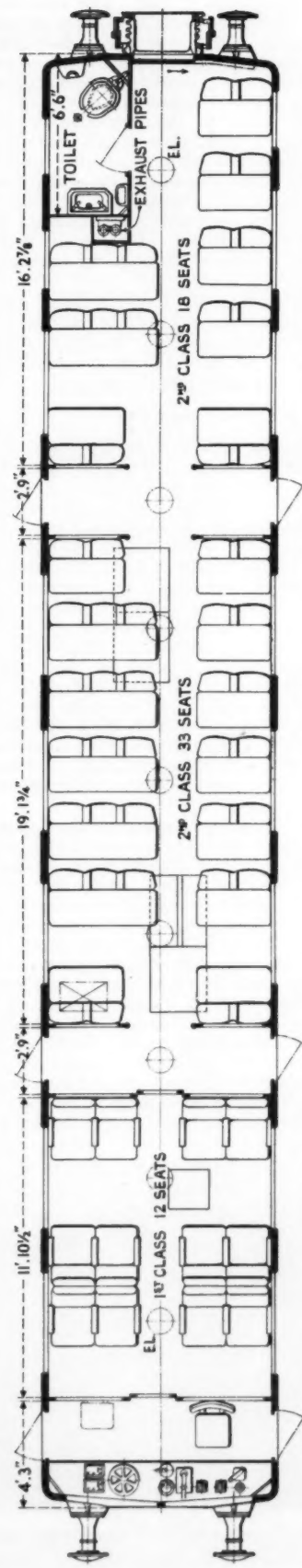
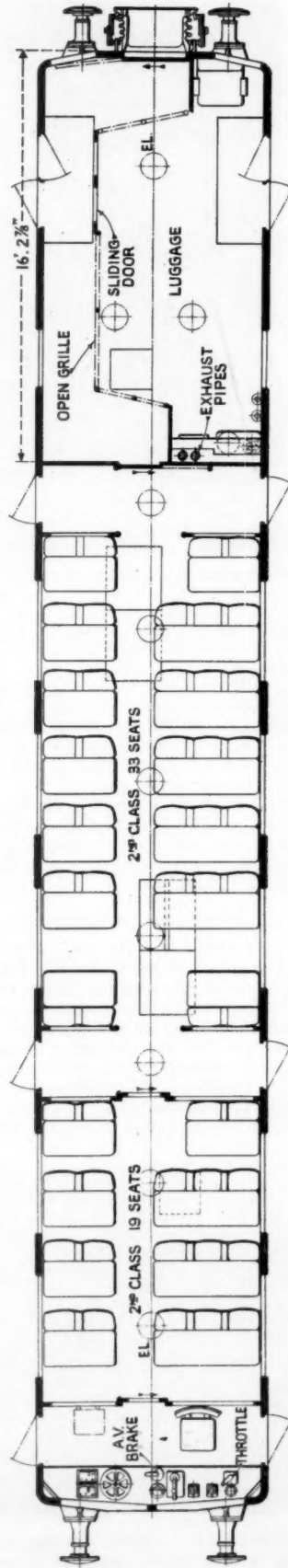
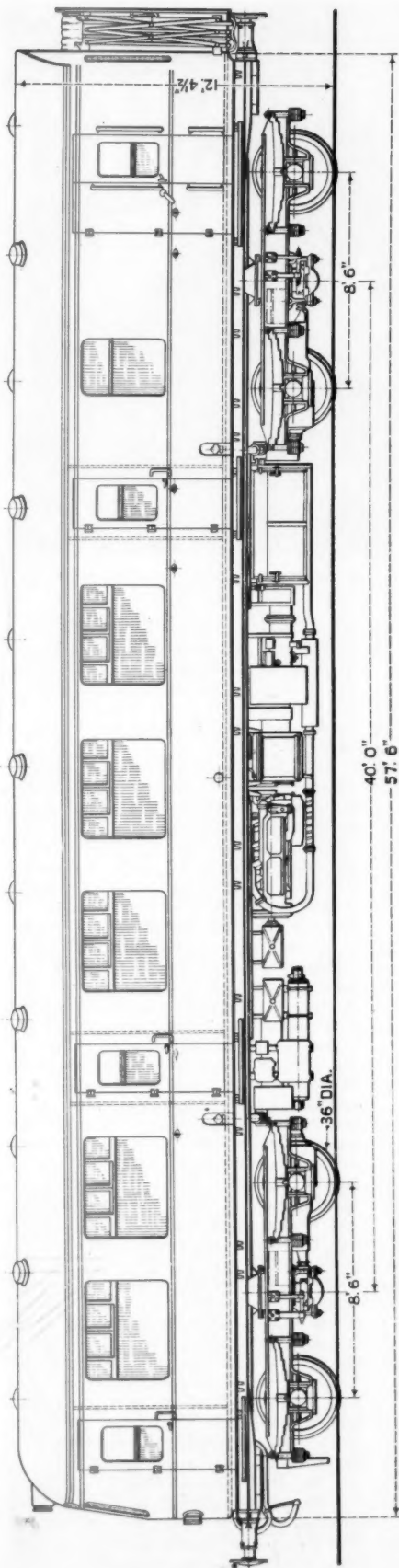
Final-drive gear engagement is selected for the required direction of travel by air-operated dog clutches. Power cannot be

applied until the dogs are fully engaged. If the dogs are in the wrong position for engagement an automatic local circuit is brought into operation upon the driver depressing his deadman handle. This applies sufficient drag torque to enable the dog teeth to engage, meanwhile holding the engine at idling speed. When the dogs have moved into correct mesh, the drag is removed and the engine permitted to increase speed.

Safety devices and interlocks are fitted to protect against loss of air pressure or incorrect operation. All starter-button circuits are isolated when engines are running. Operation of the drive handle is prevented by a mechanical interlock until the forward/reverse handle has been inserted and moved into the selected position. Also the direction selector cannot be moved unless the drive handle is in neutral.

Compressed air for control operation is provided by one 15 cu. ft. per min. compressor on each car, mounted on the auxiliary gear-box. The nominal control-air pressure varies between 75 and 95 lb. per sq. in. All the controls can be operated with pressure down to 50 lb. per sq. in. and the air and axle indicator lights on the cab panel are extinguished when the pressure drops to this figure.

The Rolls-Royce Twin Disc three-stage torque converter type DFR 10,000 has a stall/torque ratio of 4.3 : 1 at 1,500 input r.p.m. An automatic converter lock-out and double freewheel assembly are fitted. When the converter is isolated, direct drive is taken through a multi-plate clutch and an inner shaft to the output flange. A freewheel is incorporated in this drive to permit coasting. It is claimed that the fitting of this freewheel reduces fuel consumption, and by allowing the change-over from converter to direct-drive to be made with the engine idling, a very



Elevation of typical Craven-built diesel railcar and alternative interior layouts of vehicles which form the twin-car set with hydraulic transmission

smooth change is made with minimum wear on the clutch plates. Engine damage resulting from over-speed on down gradients is eliminated and a safety disconnection is provided by the freewheel in the event of engine failure or seizure.

The drive to the converter is also through a multi-plate clutch concentric with the direct-drive clutch. A freewheel on the output side of the converter allows the converter to stop when the car is running in direct drive. Both clutches are engaged by loading of the pressure plates, by oil from a continuously running pump.

Engine fuel oil, supplied direct from the main tank, is used for the working fluid of the converter. Cooling of the oil is by a heat-exchanger incorporated in the engine coolant circuit.

Final Drive

The converter unit is flange-mounted to the engine, and the drive from the output coupling to the S.C.G. RF28 final drive unit on the axle is by a torsionally-flexible cardan shaft. This shaft, developed by Rolls-Royce Limited for railcar transmissions, consists of a silicon-manganese steel torsion bar enclosed in a normal type cardan shaft tube. When running in direct-drive the torque is transmitted by the torsion bar, the torsional vibration being damped by a disc-type viscous damper incorporated in one universal joint. In the higher torque range, when the converter is in operation, excessive twisting of the shaft is limited by stops and the drive is then taken through the outer tube in the normal manner.

The Rolls-Royce eight-cylinder under-floor diesel engine is of model C8NFLH. It is a naturally aspirated engine, developing 238 b.h.p. at 1,880 r.p.m., and is a direct-injection single-bank monobloc unit of 5½-in. bore and 6-in. stroke. Engine auxiliaries are accessible from the side, and the two large oil-bath air cleaners are frame mounted. A heat exchanger is fitted for temperature control of the lubricating oil. The exhaust manifolds are water-cooled. The engine is mounted on Metalastik compression mountings at the front end and the same make of shear mountings at the rear. Torque reaction buffer stops are fitted.



Rolls-Royce C8NFLH engine and three-stage torque converter incorporating direct-drive clutch, showing oil coolers and resilient mounting group



Second class seating in composite car and showing glazed vestibule partitions

The standard range of engine protection equipment and automatic fire protection is installed.

At the free end of the engine is a short cardan shaft drive to a power take-off box, driving through multi-V belts, the C.A.V. alternator on one side and a Clayton exhaustor on the other. At the output end of the power take-off is a cardan-shaft drive to a spiral-bevel right-angle gearbox. This provides a shaft drive to the 29-in. dia. fan, a belt drive to a second exhaustor, and a gear drive to a Westinghouse E15 compressor.

Cooling and Exhaust Systems

The header tank for the Coventry radiator, which is suspended on Metacone mountings, is installed under the car seats. The cooling system is not pressurised. In one car the engine exhaust is taken to roof level through a trunk in the luggage compartment, and in the other car through a trunk on the outside of the toilet compartment.

The driving cab in each car is identical,

with an adjustable upholstered seat for the driver and an additional folding seat. Driving controls and instruments are on a sloping-top desk which extends for the full width of the cab. Provision is made for A.W.S. equipment to be installed.

The handbrake wheel and Smiths heater controls are positioned at the right-hand side of the desk, and the engine starter panel on the cab wall at the driving side. Loudaphone communication is provided between the driver and guard. The front screens have Laycock pneumatic wipers and there is a sun visor over the driver's window. The cab rear partition is fully glazed down to waist height and a sliding door allows access to the saloon. The cab roof incorporates a four-digit route and destination indicator, and a resin-bonded glass-fibre moulded ceiling.

Seating for 12 first class passengers in the composite car is arranged in facing twin-seat units adjacent to the driving cab, with a sliding-door entrance from one of the two vestibule entrances to the second class saloon. The G. D. Peters Limited tubular seat frames have foam-rubber cushions and squabs with moquette covering and Vynide trimming. The second class accommodation in this car is for 51 passengers, arranged as triple- and twin-seat units facing the cab, with the toilet at the gangway end. The vestibule partitions are fully glazed above seat level for the full width of the car, giving unimpeded vision throughout the saloon. Cut moquette trimmed with brown Vynide and white piping is used for the second class seat coverings. Parcel racks are in tubular anodised aluminium mounted on aluminium alloy brackets.

The Beclawat bodyside windows, framed in aluminium-alloy mouldings without window pans, are bonded in Prestik. J. Gibbons Limited sliding

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Gang System of Signal Maintenance

Experimental organisation in Perth area has resulted in economies and additional opportunities of staff training

*By H. O. Baldwin,
Signal Engineer, British Railways, Scottish Region*

A BRIEF description of the gang system of signal maintenance in operation on the Richmond, Fredericksburg & Potomac Railroad in the U.S.A. was published in *The Railway Gazette* of June 10, 1960. While the statement that this system of maintenance has not been adopted by British Railways may be true in general, it is not true of Scotland. Procedure in the Scottish Region is outlined below.

The problem of carrying out essential maintenance work with a decreasing number of men through inability to attract replacements, and of doing this with infrequent and sometimes contracting train services, are not peculiar to Scotland; but it was for these reasons that the first experiments with mobile maintenance units were carried out in the Scottish Region. These took place in the Perth area in 1956. It was found possible then to maintain the signalling equipment on five lines radiating from Perth to distances of 35, 30, 28, 19, and 18 miles by a gang consisting of a chief lineman, four linemen, and two assistant linemen, who were stationed at Perth and provided with road transport: a Land Rover and trailer. The amount of equipment on these lines is less than in most other parts of Britain, and a smaller, much heavier section in Perth itself was manned in the traditional way.

Organisation of Gangs

Since then the concept has been developed and modified by the introduction of work study. There are now nine such units in operation, six of them so far working under incentive bonus conditions.

In every case a chief lineman is in charge and the gang strengths vary from four to nine men. The greatest economies are achieved with the larger units, but usually limitations on size are caused by geographical considerations.

The routine maintenance work required from the unit is laid down in considerable detail: first by counting and classifying all equipment at each signal-box; then by producing job cards which detail the work in convenient quantities; and finally by producing a monthly schedule of rostered maintenance which lays out a four-weekly itinerary and indicates which work, as detailed by job card, is required to be done each day. It is recognised that routine maintenance does not constitute the whole of a lineman's work, and cognisance is taken of this when deciding on gang strengths for a given territory.

Some doubts have been expressed as to the possibility of the nearest lineman being 30 miles away. This problem has not been very serious, because the availability and mobility of a man from the unit is greater than that of a section lineman five miles away but without any transport. Important centres where failures are of greater relative importance are excluded from these arrangements, as enough work usually is concentrated in a small area to constitute a normal section, and nothing would be gained by making it part of the larger mobile section.

Besides helping to solve the original problems, other incidental advantages have been obtained from the introduction of these units. The men are available

to undertake small renewal jobs which are too large for a section lineman and his assistant, and for which an installation gang would normally be used. Their availability is greater, as they are stationed where they are required, whereas the installation gang often is not.

Training for Dual Lineman

These units also provide a good training ground for a dual lineman, that is, one who is familiar with, and competent to work on, both mechanical and electrical signalling equipment. In the past these functions have usually been separated and in the main the units necessarily have been formed with about equal numbers on each side; but it is hoped that as time goes on many of the younger men will have become completely familiar with both kinds of apparatus. The willingness to turn out at night to attend failure of apparatus has also noticeably improved, probably because there is a vehicle for the return journey. The collection and distribution of material and the recovery of scrap material in a more economical way than previously are also possible.

Much depends on the calibre of the chief lineman. A first-rate man in this position can weld the unit into an enthusiastic and efficient team. The reactions of the linemen themselves to the introduction of these mobile units have on the whole been favourable, the older men being perhaps a little less enthusiastic than the others. It is hoped to extend the scheme until ultimately there will be about 20 units operating throughout Scotland.

More Diesel Railcars for British Railways

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ventilator units are incorporated. The ceiling panels of both cars are in $\frac{1}{2}$ -in. thick white Laconite hardboard. In the second class saloons the bodyside panels are in Opaline green matt and in the first class dove grey. Mahogany timber finishings are used and the floors are covered by green marble linoleum in the second class saloons and vestibules and by grey speckled carpet in the first class saloon.

Each car is heated by two Smiths Mark III combustion heaters, mounted on the underframe and delivering filtered warm fresh air through bodyside grilles under the seats. Ventilation is by Air-Vac roof vents fitted with dust arresters.

Seating in the second class and baggage car is divided to provide a 19-seat non-smoking saloon adjacent to the cab,

and a saloon for 33 passengers, all seats facing towards the cab. The luggage compartment, with a steel-mesh enclosure to form a through corridor, has a distributed load capacity of 1.5 tons.

Body Construction

The body rails are in $\frac{1}{2}$ -in. Corten steel, with $\frac{1}{4}$ -in. mild-steel pillars, 16 s.w.g steel bodyside panels and 16 s.w.g galvanised steel roof sheets. Sprayed Limpet asbestos on roofs, bodysides, and ends, and mineral wool in the floors provide the sound and heat insulation. The floor is made up of corrugated Corten steel sheets, with the mineral wool on top and covered by $\frac{1}{2}$ -in. multi-ply. On this is laid $\frac{1}{2}$ -in. thick Sundeala board and the linoleum covering. The underframes are built up from rolled and pressed steel section, with Oleo-Pneumatic buffers. Bogies are to British Railways standard pattern with Timken roller-bearing axleboxes. Vacuum braking is of the

Gresham & Craven quick-release type. Battery charging is by a C.A.V. alternator and rectifier.

Sub-contractors include the following:-

| | |
|-------------------------------------|--|
| Engines, transmissions and controls | Rolls-Royce Limited |
| Final drive unit | Self Changing Gears Limited |
| Brake equipment | Gresham & Craven Limited |
| Axleboxes | British Timken Division of Timken Roller Bearing Company |
| Wheels and axles | Owen & Dyson Limited |
| Laminated springs | William Griffiths Limited |
| | Steel, Peech & Tozer Limited |
| Coil springs | Turton Bros. & Matthews Ltd. |
| Flexible mountings | Metalastik Limited |
| Windows | Beckett Laycock & Watkinson Limited |
| | James Gibbons Limited |
| Seat frames | G. D. Peters & Co. Ltd. |
| Upholstery | J. Holdsworth Limited |
| | T. F. Firth & Sons Ltd. |
| | Imperial Chemical Industries Limited |
| Insulation | J. W. Roberts Limited |
| | Cape Asbestos Co. Ltd. |
| Plastic panels | Formica Limited |
| | Wareite Limited |
| Blockboard and plywood panels | Edmonton Panel Co. Ltd. |
| Buffers | Insulation Equipment Limited |
| | Oleo Pneumatics Limited |

Improved Lighting at Liverpool Street Station

Installation of colour-corrected mercury-vapour and cold-cathode lighting



General view of lighting on west side of station

THE Eastern Region of British Railways has recently undertaken the installation of a completely new lighting system at Liverpool Street Station. Electric lighting at the station was installed between 1927-1928 and serious consideration was given during recent times to the complete renewal of wiring and fittings; this being deferred because of possible major improvement schemes.

Open-flight Cables Removed

With the introduction of the new high-voltage electrified overhead traction system it was decided that, for maximum safety of both staff and public, all overhead open-flight cables serving lighting circuits should be removed. The existing installation consisted mainly of filament lighting in enclosed opal glass spheres suspended on steel wire hawsers from the roof to a distance of 20 ft. above platform level. The height factor was no doubt determined by the need to keep the lighting below the thick pall of smoke and steam, as well as by the need to keep the fittings easily accessible for maintenance purposes.

The overall result of these measures, however, was to give the station lighting a pronounced "tunnel" effect. In planning the new installation it was therefore decided that five conditions must be satisfied to ensure complete success. These were: (1) Good overall illumination; (2) lighting which would blend with the building and enhance the general appearance; (3) ease of maintenance; (4) the improvement in lighting should be obtained economically; (5) the installation of the improved lighting

should be achieved with the minimum inconvenience to the travelling public.

The maintenance factor required serious consideration in planning the new installation and following a close examination of the roof and supporting structure, it was decided to take advantage of the network of catwalks already existing on the roof for the purpose of cleaning the glass roof-lights. It was also noted that there were certain open sections in the roof which allowed smoke to escape easily and these openings often followed the same lines as the catwalks.

Modifications to Roof

With the collaboration of the Chief Civil Engineer, Eastern Region, certain selected glass panels in the roof were replaced by sheet metal hinged access hatches, together with supports for the light fittings. It was also possible to install all the sub-circuit wiring on the roof, which ensured that the new lighting system could be carried out without interfering with the existing lighting.

It was decided that the colour-corrected mercury-vapour form of lighting would be ideal when housed in high bay dispersive reflectors. This would create a sense of spaciousness as well as enhancing the cathedral-like proportions of the station building.

By calculation, the 1,000-W unit, giving a lighting value of 50,000 lumens, would effectively illuminate the area when spaced between 60-70 ft. and mounted at a maximum height of 60-65 ft. This arrangement, although most desirable, would affect quite a large

area if one lamp failed and, bearing in mind the importance of the station, it was decided to use a 400-W. unit every 30 ft. and symmetrical with the roof structure. The combination of lighting, method of fixing and wiring which satisfied the five conditions, had now been achieved.

Lighting of Low-level Areas

Certain low-level areas still required special consideration, such as ticket barrier gates, parcels concentration areas, and the open portions of the platforms. Cold cathode lighting was best suited for this purpose because of its long life, reducing maintenance, and its good colour-rendering properties.

Linear cold cathode fittings fitted over the ticket barrier gates serve to highlight this area making ticket examination easier, as well as creating ideal conditions for increasing the flow of passengers through the barriers. Similar fittings are used on the open portions of the platforms, mounted on 11-ft. 6-in. taper slim concrete columns, specially designed and manufactured for the purpose. Each fitting bears the name of the station.

In addition, certain platforms required individual illumination and a decorative type of cold cathode fitting, mounted vertically along the walls at a height of approximately 15 ft., was specially designed to add a distinctive touch to the overall lighting scheme.



Wall lights above footbridge on west side of station

The arrangement used for suspending the high-bay lighting units consists of two 1-in. x 1-in. M.S. bars 18-in. long, pin jointed at three points to give

(Continued on page 628)

Power Signalling Installation at Pelaw

A stage in the progress of colour-light signalling in the North Eastern Region



Pelaw power-operated signalbox under construction, showing the glass-encased control room

THE power operated signalbox at Pelaw junction in the North Eastern Region of British Railways, which started operating at the beginning of October, completes another stage in the progress of the installation of modern colour-light signalling throughout the Tyneside area.

The original gantry-type structure has been replaced by the new box, which has also taken over the functions previously carried out by the signalbox at Springwell. The building, which stands at the junction of the Newcastle-Sunderland line and the branch lines to South Shields and Washington, is modern in concept and functional in design. The relay room, situated at one end of the structure, is surmounted by a glass-encased control room which houses the switch console and track diagram, and affords maximum visibility. The power house, containing a standby diesel driven alternator and three compressors providing air pressure for operating point mechanisms, is adjacent. Both buildings are of steel-framed construction and have facilities for jacking-up in the event of mining subsidence.

Extent of Control

The new installation controls 11½ track miles (5½ route miles) from Felling on the Newcastle side to a point close to Hebburn on the South Shields line, Boldon Colliery on the Sunderland line and Wardley on the Leamside Branch. It incorporates colour-light signalling and route relay interlocking. There are 21 colour-light signals of the multi-unit type, six of which have junction direction indicators; 10 ground signals of the position-light type for controlling shunting operations, and 15 electro-pneumatic-

ally operated sets of points. The whole of the track under control is divided into 67 track circuits, and the occupation of any of these by trains automatically controls the protecting signals and points.

The control room houses a switch console 6 ft. 6 in. long and a panel carrying a diagrammatic plan, 12 ft. 3½ in. long, of the track controlled. The panel is arranged in three sections mounted on plinths, and the total length of the diagram and plinths is 7 ft. 3 in.

Arrangement of Route Switches

The route switches are arranged in two tiers on the console, odd numbers on the upper tier and even numbers on the lower. Point switches, for individual operation of points, are above the route switches. Each signal has its route switches in one group, with small indication lights positioned above each group. Red and green indications are provided for the main signal and a white one for a subsidiary signal.

Point indications are situated above the point switches. A normal and reverse white-light indication is provided with a flashing white warning-light in the event of the points failing to function correctly. The point switches are a three-position type; normal, reverse, and central. Except when required for individual point operation, these switches are in the central position and the setting of a route for the passage of a train can only be achieved by the route switches when all the point switches applicable to the route are in the central position.

Block instruments are fitted into the console for use when an adjacent signalbox "switches-out." Absolute block working is enforced automatically

through the block switches in the adjacent signalboxes. This does not apply to Wardley Signalbox where block working is continuously in operation.

Operating Procedure

The main signal controlling the entry of any train into a particular section of line can only be cleared when the operation of the route switch has set the points for the route required to be covered. One feature of the interlocking is a "points-free-to-be-set" relay, which, when energised, proves that routes which may conflict with the one desired to be set, are normal. The turning of the route switch operates a reverse relay in which circuit the points in the route are proved correctly laid, or free to be set in the position required. With the reverse relay energised, this operates the reverse route lock relay which locks, or sets and locks the points, in the desired position. This method of operation saves in wiring and the duplication of proving contacts.

The track is proved clear and the points correctly set before the main signal displays a clear aspect. A route switch must be restored to normal before a conflicting route can be set and the system is designed to prevent pre-setting. Approach locking, which is a further safeguard incorporated in the system, ensures that the route set up cannot be altered in the path of an oncoming train. The presence of a train on the track circuits approaching any signal automatically prevents the "normal" lock relay from being energised. This prevents any restoration of route until the train has either moved on to the overlap track circuit or the approach locking has been released by the automatic time delay releasing relay.

The relay room, situated on the ground floor below the operating room, accommodates all the interlocking relays-together with track, point indication and signal control relays, many of which are of the miniature plug-in type, and much smaller than those used in previous installations. All the interlocking relays are magnetically latched both normal and reverse. The wiring is in 16/012 p.c.p. cable laid in p.v.c. wire trays.

Power Supplies

One power supply is obtained from the Electricity Authority at 415V. three-phase and this is transformed into 650V. single-phase. Should this supply fail, a standby diesel driven alternator would cut in automatically to take the load. Of the three compressors providing the air pressure required for operating point mechanisms two are driven by 415V., three-phase 50-cycle motors, and the third, a standby, is diesel driven. Only one compressor is normally required to maintain the pressure in the reservoir tanks, but if this is not sufficient, the

other compressor supplements it automatically.

The air supply system is a two pressure type. Warm air at about 125 lb. per sq. in. passes from the compressors to the high pressure reservoir tanks, through a reducing valve into the low pressure tanks, and ultimately to the air main at a pressure of 50 lb. per sq. in. It is cooled in the process by an intercooling system.

Signals and Junction Indicators

The main signals, some with four and some with three aspects, are of the multi-unit type, and the lamps used in each aspect are 12V. 16/24W. The 24W. auxiliary filament is brought into operation on failure of the 16W. main filament. The two-position-light type shunting signals display a red and white light in the horizontal position for "stop" and the proceed aspect is indicated by two white lights inclined at 45 deg. The lamps used in these signals are 110V. 25W. for the white lights and 110V. 40W. for the red. The subsidiary signals associated with the main signals have no red light. The proceed aspect is in the form of two white lights at 45 deg. and, if a "calling on" indication is required, an illuminated "C" is displayed.

Junction direction indicators, provided on main signals where an indication of divergence from the straight route is required, have five lights in a row, and when illuminated present a "bar" of white light, thus giving high speed trains a clear indication of the route. The radial position of the junction indicator gives the direction of the route. If three or more lamps fail, the associated signal would remain at red.

A.c. reactance fed track circuits are used throughout and, to provide a return for traction currents, single rail circuits are used in the vicinity of the signalbox. On lengths of straight track double rail Impedance Bond track circuits are used, thus providing two rails for the traction return. The feed sets consist of a

110/12V. transformer with adjustable reactance and the relays are of the double element type with a 110V. local coil and a 1·2/2V. control coil.

Point Operation

The operation of all point mechanisms is carried out by compressed air supplied from the power house through 1 in. dia. alkanthene air mains, the route of which is in the form of two loops laid in concrete ducts, one east and the other west of the signalbox. Point machines are supplied from the air main by ½ in. dia. steel pipes, which are connected to the main at convenient positions.

The electro-pneumatic point layout comprises an economic point movement driven by a pneumatic point cylinder motor, 5 in. dia. by 8 in. stroke, controlled by a 24V. electrically-operated cut-off valve which cuts off the air supply to the cylinder as soon as a full operation is complete.

Continuous electrical detection of the position of each switch blade, the facing point lock, and cut-off valve is provided. The correct detection is proved in all signals relating to the points in addition to the indications on the control panel.

Telecommunications

All the main signals are fitted with selective telephones which, when operated, are connected to the signalbox. An illuminated indication, operating automatically, informs the signalman from which signal the call is coming. A keyboard situated on the console facia panel enables the operator to switch to any of the various circuits brought into the signalbox, and an illuminated stencil above the appropriate key shows the waystations on the particular circuit and the code required to communicate with any one of them. Codes are transmitted to the selected circuit by a push-button and communication is effected by a telephone handset. Two of these handsets are installed, one connected if

any of the circuit keys are up, the other with any one depressed, thus enabling both handsets to be in use at one time.

The scheme was initiated, planned and brought to completion under the direction of Mr. A. F. Wigram, Signal Engineer, North Eastern Region. The signalling contractor for the scheme was the Westinghouse Brake & Signal Co. Ltd., which carried out the major portion of the installation work. Work at the adjacent signalboxes was carried out by the Signal Engineer's own staff. The Civil Engineering and construction work was carried out under the direction of Mr. E. L. Triffitt, Chief Civil Engineer, North Eastern Region.

Improved Lighting at Liverpool Street Station

(Concluded from page 626)

flexibility, with a light chain attached to the fitting and the access panel. When the hatch is lifted, it draws the fitting towards the aperture and so eases maintenance. The control gear for this fitting is housed in a cast-iron box supported in the run of conduit, and the connection to the lighting unit is taken through a flexible lead from a three-pin 5-A. socket outlet secured to the side of the box. This plug can be withdrawn when working on the fitting, thus ensuring complete isolation from the mains supply.

Alternative Power Supply

Because of the importance of the station and as the Great Eastern Hotel adjoining it is supplied from the M.V. network, it was found necessary to provide an alternative source of supply for emergency purposes. This has been taken from the London Transport Executive system at 33½ cycles. This service has been used in the station lighting scheme by connecting all the concourse high bay fittings to this supply and in the event of the 50-cycle supply failing, sufficient lighting would be available to enable the station to operate.

The electricity service is brought to the station in the form of parallel 6-kV. cables, connected to three 500-KVA transformers housed in the electrical substation on No. 18 platform, and the medium voltage distribution is comprised of two inter-connected circuit ring mains of 0.4 sq. in. cables.

The switchgear and linkboxes on this ring main system were being seriously overloaded and the opportunity has now been taken to replace these by four sets of English Electric cubicle-type switchgear.

The whole of the installation was designed by Mr. T. C. B. Miller, Chief Mechanical & Electrical Engineer, Eastern Region, British Railways, and the installation was carried out under supervision by Clough Smith Limited.

The principal sub-contractors were as follow:

| | |
|--|----------------------------|
| Ranmore high-bay dispersive reflectors | Falk Stadelmann Limited |
| Cold cathode fittings | Ionlite Limited |
| MBF/U lamps and control gear | General Electric Co. Ltd. |
| Cubicle switchgear | English Electric Co. Ltd. |
| Cable laying and switchgear installation | Johnson & Phillips Limited |



Interior of the new power-operated signalbox at Pelaw

RAILWAY NEWS SECTION

PERSONAL

We regret to record the death on November 21, of Sir John E. Thornycroft, Chairman & Managing Director of John I. Thornycroft & Co. Ltd.

Mr. M. G. Maycock, B.Sc.(Eng.), M.I.C.E., Civil Engineer, British Railways, Scottish Region, who has recently retired, was educated at Stonyhurst College, and graduated

year. Mr. Atkinson was educated at Oundle School and Sheffield University, after which he became an engineering pupil with Vickers Limited. From 1912 to 1916 he was Assistant Manager at the drop forge of Vickers Limited, after which he was seconded to the Ministry of Munitions as Director of Forgings & Castings and later to the Air Ministry as Director of Materials & Supply (Rolls-Royce Engine Branch). From 1919 to 1924 he was Deputy Manager of the

Engineer, Southern Area of the former L.N.E.R., at London, Kings Cross, and became Senior Assistant in 1938. In 1939 he became Acting Assistant District Engineer, Boston, and in 1943 Acting Chief Assistant (Maintenance), Southern Area, L.N.E.R., at London, Kings Cross, in which position he was confirmed in a permanent capacity in 1945. Subsequently he held appointments at Kings Cross as Chief Assistant (Permanent Way) in 1946, and



Mr. M. G. Maycock

Civil Engineer, British Railways, Scottish Region, 1954-60



Mr. H. C. Orchard

Appointed Civil Engineer, British Railways, Scottish Region

B.Sc. (Engineering) at the University of London. He entered the service of the North Eastern Railway in the department of the Civil Engineer at York in 1915, and, following service in a number of districts and in various headquarters sections, was appointed Permanent Way Assistant, York, L.N.E.R., in 1937, subsequently assuming charge of the New Works Section there. Mr. Maycock became Assistant District Engineer at Darlington in 1939; Assistant Engineer (Maintenance), York, L.N.E.R., in 1943; Assistant Engineer, Scottish Area, L.N.E.R., Edinburgh, in 1945, and District Engineer, London, Kings Cross, L.N.E.R., in 1948. In 1952, he was appointed Assistant Civil Engineer, Scottish Region, British Railways, and was promoted to be Civil Engineer in September, 1954. Following his retirement, Mr. Maycock has accepted an appointment as Principal, British Railways School of Transport, Derby.

We regret to record the death, on November 12, of Mr. R. M. Atkinson M.I.Mech.E., M.I.Mar.E., Chairman, Sulzer Bros. (London) Ltd. He was in his 71st

Railways Department of Vickers-Armstrongs Limited, after which he undertook extensive travelling for Vickers Limited and associated companies in connection with overseas sales policy. After some 30 years with the Vickers organisation, he left in 1938 to join the Sulzer organisation as Managing Director of Sulzer Bros. (London), Ltd., the position he held until his appointment as Chairman in June this year. In 1952 he joined the board of Richardsons, Westgarth & Co. Ltd., and their subsidiary company, George Clark (Sunderland) Limited, which appointments he retained until his death.

Mr. H. C. Orchard, M.I.C.E., Assistant Civil Engineer, British Railways, Scottish Region, who, as recorded in our November 11 issue, has been promoted to be Civil Engineer of that region, began his railway career with the Great Eastern Railway in the District Engineer's Office, Ipswich, in 1920, after which he served at London (Liverpool Street), Ipswich and Boston. In 1937 he was appointed Junior Assistant in the Construction Office of the

Permanent Way Assistant to the Engineer in 1947, redesignated Assistant to Civil Engineer (Permanent Way), Eastern Region, British Railways in 1948. In 1950 he was appointed District Engineer, Stratford, and in 1953 became Acting Assistant Engineer (Permanent Way) at London, Kings Cross. In 1954 he was appointed to Scotland as Assistant Civil Engineer in the Region, the position which he has now vacated to take up his new appointment.

Mr. T. P. Strafford, Divisional Traffic Manager, Manchester, British Railways, London Midland Region, began his career in the former L. & N.W.R., not, as stated in error in our November 11 issue, in the L.N.E.R.

M. E. Mouloud has been appointed President of the Algerian State Railways with headquarters in Algiers. He was born and trained in Algeria, and has been in the service of the Algerian railways (first the Etat and later Algerian Railways) since 1924. He has been Deputy-Manager since 1956.

Mr. Charles Thomas Henfrey, A.M.I.C.E., Chief Engineer of East African Railways & Harbours, who, as recorded in our October 28 issue, retired at the end of October, entered the service of the Railway Administration in 1935 as an Assistant Engineer, having previously served with the Public Works Department, Kenya, for nine years. From April, 1946, he acted as District Engineer, Lake Engineering District. He became District Engineer in January, 1947. Early in 1949, he was promoted to be Acting Senior District Engineer at Railway Headquarters, Nairobi, and, by the end of that year, his rank was substantiated and he

Manager, Manchester, and subsequently became District Passenger Manager, Manchester. In March, 1926, Mr. Dandridge was appointed District Passenger Manager, London, L.N.E.R., and, in January, 1928, Advertising Manager, London & North Eastern Railway. In this capacity he introduced, as a standard of railway printing, the now famous Gill Sans type, and initiated the first railway Poster Exhibitions at the New Burlington Galleries, London. He was appointed Passenger Manager, L.N.E.R. (Southern Area), in July, 1945, and, in December, 1947, added to the Passenger Manager's duties those of Goods Manager.

early age for those days, he became District Passenger Manager of the newly-formed L.N.E.R. at Manchester. Three years later his success in that sphere led to his appointment as D.P.M. in London.

"At a very early stage in his training C.G.D. came into contact with the publicity department and he developed a flair for publicity and advertising which was closely associated with his knowledge and appreciation of pictorial art and typography. It was fitting, therefore, that he should be chosen to succeed Mr. W. M. Teasdale as Advertising Manager of the L.N.E.R. in 1928. For the next 11 years he did much to improve the



Mr. C. T. Henfrey

Chief Engineer, East African Railways & Harbours,
1952-60



The late Mr. C. G. G. Dandridge

Formerly Chief Commercial Manager, British Railways,
Eastern Region

assumed the duties of Resident Engineer responsible for the Nairobi-Nakuru realignment. In 1951 he became New Works Engineer, and, in 1952, Way & Works Engineer. Subsequently he became Assistant Chief Engineer, and was promoted to be Chief Engineer in September, 1954.

We regret to record the death, on November 17, of Mr. C. G. G. Dandridge, C.V.O., M.Inst.T., formerly Chief Commercial Manager, Eastern Region, British Railways. He was born in 1890, and began his railway career with the former Great Central Railway in December, 1905. After a short period in the General Manager's Office, he passed the Great Central Higher Grade Examination, and received special training in various departments from July, 1911, until he joined H.M. Forces in March, 1915. He served in France, North and South Russia, and as District Traffic Superintendent, Anatolian Railway, Turkey. He was demobilised in 1920, with the rank of Major in the Royal Engineers. On his return to railway duties, he was appointed Assistant District Traffic

In 1948 he became Commercial Superintendent, later re-designated Chief Commercial Manager, from which position he retired in September, 1955. Mr. Dandridge was awarded the C.V.O. in 1948. The funeral service was conducted at Kensington on November 22.

AN APPRECIATION

A. A. H. writes:—

"Cecil Gerald Graham Dandridge, born in 1890, became a railwayman at the early age of 15 in the service of the former Great Central Railway. A few years later he became one of a distinguished band of able young men who qualified by examination for higher grade training by his Company. Many of those young men subsequently made their mark on and off the railway, and C.G.D. was prominent among them. He entered the Royal Engineers in 1915, at the end of his training, and his linguistic attainments took him into various theatres of war, including Russia. He reached the rank of Major.

"After the war, he quickly gained promotion and in 1923, at a comparatively

style and standard of railway advertising. He encouraged distinguished artists to paint posters: he improved the format and appearance of timetables and he adopted a form of type which gave style and clarity to the printed word in advertisement.

The second world war interrupted advertising work and C.G.D. returned to passenger business, becoming Passenger Manager of the Southern Area of the L.N.E.R. in 1943, after assisting his predecessor in that office for a couple of years. When the railways were nationalised C.G.D. was appointed the first Commercial Superintendent of the Eastern Region of British Railways, subsequently being styled Chief Commercial Manager. In that post he was responsible for freight as well as passenger commercial business and he continued in it up to the date of his retirement in August, 1955, after nearly 50 years' railway service.

"For many years C.G.D. was actively concerned with the railway journeys of the Royal Family and Her Majesty the Queen bestowed upon him the honour of C.V.O. in 1954."

NEW EQUIPMENT AND PROCESSES



Loaders and Dumpers

THE Muir-Hill range of loaders and dumpers has been increased by the addition of two new machines, the 2X hydraulic loader and the 18B dumper.

The 2X loader has interchangeable $\frac{1}{4}$ -, $\frac{1}{2}$ -, and $\frac{3}{4}$ -cub. yd. buckets, and its features include 50 deg. roll-back bucket action, compactness, and manoeuvrability. Double-action rams operate the tip and reset movements of the bucket, giving a pry out force of 2,500 lb. The buckets are fitted with wear-resistant blades. A maximum forward reach of 3 ft. 9 $\frac{1}{2}$ in., and a turning circle of 20 ft. 9 in. are provided. The machine is fitted with a Petter P.H.2T. air-cooled diesel engine developing 17 b.h.p. at 1,800 r.p.m. The drive to the wheels is taken through a three-speed constant-mesh gearbox, propeller shaft, and bevel differential gear. An engine-driven pump supplies hydraulic power for the single-acting rams, which lift the main beams and bucket with a tearaway force of 2,800 lb. Internal-expanding 12 in. dia. by 2 $\frac{1}{2}$ in. brakes are mechanically operated by foot-pedal. Advantages claimed for this machine include ease of operation, finger-light steering, good all-round vision, and a high standard of driver comfort.

The 18B dumper (illustrated) has a 6-cu. yd. capacity and a number of different versions of all-steel body is available for handling a variety of bulk materials. Provision is made for either hydraulic or gravity tipping. A Fordson six-cylinder diesel engine is installed, developing 96 b.h.p. at 2,250 r.p.m. The constant-mesh gearbox gives five forward speeds ranging from 2.6 to 20.5 m.p.h., and five reverse speeds over the range 2.0 to 16.0 m.p.h. An auxiliary gearbox gives directional change. The final drive is through a double-reduction driving axle incorporating worm and epicyclic gears. Other features include hydraulic power-assisted steering, two-way driver control, and internal expanding air-operated brakes.

Further details may be obtained from E. Boydell & Co. Ltd., Old Trafford, Manchester, 16.

Joint Breaker

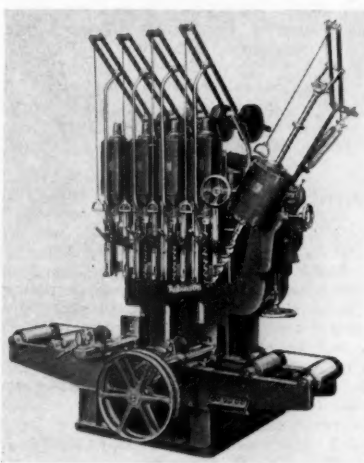
PITAN joint breaker has been formulated to facilitate the dismantling of joints and couplings, and is suitable for use in railway repair shops and maintenance depots.

It is a medium viscosity liquid, specially compounded to ensure easy, safe, and speedy disconnection and removal of pipe flanges, couplings, unions, sockets, ferrules, and so on by emulsification of the jointing compound applied to their faces, surfaces, and threads. Mechanical damage to components during the process of separation is thus avoided.

It is essential for the joint breaker to enter the joint to obtain its full effect on the jointing compound; where joints and couplings are horizontally placed the method of application of the joint breaker is by pouring or brushing on. Where positions of joints renders this method ineffective, a reservoir or moat of clay or other suitable material has to be formed round the joint to enable it to be submerged in the liquid.

After the joints have been disconnected the jointing compound can be wiped clean from the components. The joint breaker does not attack metals, but because of its properties which enable it to emulsify jointing compound, it is injurious to various other non-metallic materials. It is not claimed to be capable of breaking the joint of a rust-locked coupling.

Further details may be obtained from Allweather Paints Limited, 36, Great Queen Street, London, W.C.2.



Multiple Wood-Boring Machine

THE KO/E multiple-spindle heavy-duty borer, manufactured by Thomas Robinson & Son Ltd., is primarily designed for railway carriage and wagon building, and is also suitable for boring hardwoods and softwoods up to 16 in. square section.

The machine consists of four independent vertical boring units mounted on a heavy main frame, to which may be added a tilting boring unit, as illustrated, at either or both sides of the machine for angular or vertical boring. Either a fixed or a travelling table may be fitted.

The design of the boring units allows production on a one-off or a repetitive basis with equal facility. Each boring unit has rapid and independent cross-traverse adjustment by hand-lever, with pre-positioning stops for repetition work. With the boring units fitted with different sizes of augers, several sizes of hole can be bored consecutively and in most cases all drilling operations can be completed on the work during a single pass through the machine. This, it is claimed, results in a considerable saving of time and effort, and the almost complete elimination of re-handling heavy sections.

Each vertical boring unit has a 7 $\frac{1}{2}$ -h.p. rotor and stator unit driving the splined spindle directly. Only the spindle, chuck, lower bearing, and auger move vertically, controlled by a counter-balanced manual

lever. Stops are provided to limit the movement as required, the maximum vertical movement being 17 in. Self-locking hand levers control the cross-traverse movement, which is 14 in. maximum. Each tilting spindle is driven by a 5-h.p. motor. The angle of tilt, up to a maximum of 30 degrees to the vertical, is controlled by handwheel, and is indicated on a scale. Manual vertical and horizontal adjustment is provided.

The fixed table is a heavy frame, mounted on the baseplate and equipped with rollers and clamps for positioning the work. The travelling table is of fabricated steel construction and mounted on roller stands. Idle rollers and clamps are provided for loading and positioning the work. Traversing is normally by hand, but motor operation can be provided. The standard table can take timbers up to 16 ft. long.

The maximum size of auger which can be used is 3-in. dia., and the maximum depth of bore is 16 in.

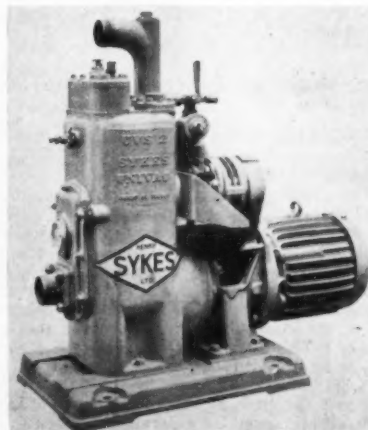
Further details may be obtained from the manufacturer, Thomas Robinson & Son Ltd., Rochdale.

Self-priming Pump

THE Univac 2-in. self-priming centrifugal pump has a capacity of 6,500 gal. per hr. when operating on a suction lift of 10 ft. and a nominal head, or 8,000 gal. per hr. at nominal lift and a total head of 20 ft. The pump will pass solids of up to 1 in. dia., and will handle slurries containing up to 60 per cent solids. Priming time on a 10-ft. suction is 12 sec., and on a 28-ft. suction, 65 sec.

The operating principle consists of the maintenance of a partial vacuum in two chambers located above the centre line of the pump and preceding it in the suction line. The partial vacuum is maintained in the chambers, which are interconnected, by a small auxiliary rotary vacuum pump. The function of the first chamber is to collect any air passing up the suction line and to maintain a reservoir of water, while that of the second chamber is to prevent water reaching the vacuum pump.

The pump castings, the casing wearing plates, and the impeller are of close-grained cast iron. The impeller is mounted on a mild steel shaft with renewable sleeves. The pump normally is powered by an English Electric 3-h.p., three-phase, 50-cycle 400/440-V. motor, which is overhung from the pump unit and provides a direct drive to the impeller. Alternative types of motor may be



used to suit special conditions such as flame-proof operation or supply voltages within the range 100 to 600. The overall length of the unit is 3 ft., the width 1 ft. 6 in., and the height 3 ft. The total net weight is 480 lb.

Further details may be obtained from Henry Sykes Limited, 536, Southwark Street, London, S.E.1.



Road Ripper

THE Holman SS.80 road ripper is an all-steel machine which can readily break heavy, dense aggregate, and is designed to withstand very rough usage with the minimum of maintenance. It is available with either a spring or a latch-type retainer.

A built-in lubricator meters the correct amount of oil and allows the machine to be operated over a shift-period with a single filling. It is claimed that the compactness of the design, combined with good balance and low vibration reduces fatigue of the operator to a minimum.

Conversion of the machine for pile driving can be carried out by replacing the normal front head by a special head to which side plates are attached and in which a driver pad is fitted. In this form, circular wood piling up to 6 in. dia., wood sheet piling up to 3 in. thick, and most types of steel piling can be driven.

Further details may be obtained from the manufacturer, Holman Bros. Ltd., Camborne, Cornwall.

Arc-Welding Electrodes

LINCOLN NuFive and NuSeven arc-welding electrodes are intended for the welding of mild steel.

The NuFive is a smooth-flowing mild-steel electrode of the cellulose type and can be used with a.c. or d.c. for welding in all positions. It is claimed to give good penetration qualities and its properties of a high melting rate and readily controlled slag makes it particularly suitable for pipe welding, using either the conventional or stovepipe techniques. This electrode conforms with B.S. 639/52 and the British classification is E.111 (B.S.1719).

The NuSeven is of the iron powder-rutile type, also designed for general application to welding of mild steel in all positions. Advan-

tages claimed for this electrode include a higher deposition efficiency than that obtainable with conventional titania (E.317) electrodes, a faster deposition rate, and less sticking of the electrodes, enabling up to 30 per cent more weld per electrode to be obtained and thus reducing production costs. It is also claimed that good slag control facilitates positional welding, and in many cases the slag is self-releasing. The British classification is E.917 (B.S.1719).

Both the NuFive and the NuSeven are approved by Lloyds Register of Shipping and the Ministry of Transport for welding of mild steel in all positions.

Further details may be obtained from Lincoln Electric Co. Ltd., Welwyn Garden City, Herts.

Shock Indicator

AN overload indicator, when mounted with sensitive equipment in a box, crate or container, is claimed to indicate any excessive shock or load which may have occurred in transit. Any such shock trips a spring-loaded mass which bares a red colour spot behind a transparent plastic cover. Two of these units, each about 1½ in. dia. and 1½ in. deep, placed back to back, should provide full spherical sensitivity.

Further details may be obtained from the General Dynamics Corporation, 3595 Frontier Street, San Diego 10, California, U.S.A.

Petrol Dispenser

LIQUIDS for which the Model 100 Portameter is approved by the Board of Trade have been extended to include petrol.

The pump, which can be used either in a permanent position or mounted on a vehicle for mobile dispensing, originally was passed for use only with paraffin and diesel and fuel oils. It is built to the standards of the Department of Weights & Measures.

Further details may be obtained from E. & E. Pump Services Limited, Limes Place, West Croydon, Surrey.

Milling Heads

ARCHDALE unit milling heads are built in three sizes, having 8-in., 10-in., or 12-in. quills, and comprise both vertical and horizontal patterns. These are shown, left and right respectively, in the illustration below.

Both versions are suitable for mounting on transfer machines and traversing slides on transfer machines, the vertical type being

also designed for mounting on columns and the horizontal type on beds. They are powered by 5—50-h.p. motors and can be supplied either right or left-handed.

The spindle is housed in the quill with a 2-in. axial stroke. Within this stroke the quill may be advanced, clamped, and retracted manually, or by automatic hydraulic control after initial cutter setting. A standard foot-mounted motor drives the spindle through vee belts and helical spur gearing. Parallel roller-type bearings are fitted at front and rear, that at the front having a taper bore and being opposed by a radial thrust bearing. The complete spindle assembly can be withdrawn for servicing.

Within the speed range, spindle speeds are built in to suit the particular requirements. One speed only is available, but this can be adjusted by alternative pairs of change gears. Speeds outside the standard range can be obtained by changing the pulleys and the belts.

Further details may be obtained from the manufacturer, James Archdale & Co. Ltd., Ledsam Street, Birmingham, 16, or from the sole agent, Alfred Herbert Limited, Coventry.

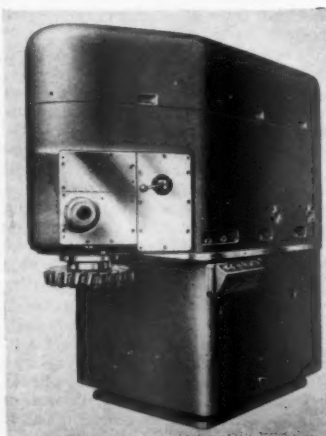
Extended Diesel-Engine Range for Rail Traction

SULZER railway-traction diesel engines with vee cylinder arrangement are being developed in France to extend the range of power available from the present maximum of 2,500 b.h.p. of the twin-bank vertical 12LDA28-B unit, to 3,500 b.h.p.

The new LVA24 engine range, with a bore and stroke of 240 mm. by 280 mm., uses a straight-forward side-by-side arrangement for the connecting rods, and bearings have been developed to withstand the loads imposed by high pressure charging up to 210 lb. per sq. in. brake mean pressures. The rated speed is 1,050 r.p.m. compared with the maximum of 750 r.p.m. for the earlier designs. Weight per horsepower is reduced by about 32—35 per cent. The speed increase should also enable lighter generators to be used in certain applications.

Eight-cylinder 8LVA24 vee-type engines which develop 1,750 b.h.p. continuously at 1,050 r.p.m. and weigh 10.3 tons dry are undergoing service trials. The first batch of 12-cylinder 12LVA24 units is under construction; these will develop 2,650 b.h.p. and weigh 14.2 tons. The largest size will be the 16LVA24 developing 3,500 b.h.p. at the same speed, with a dry weight of 18.2 tons.

Further details may be obtained from Sulzer Bros. (London) Ltd., 31, Bedford Square, London, W.C.1.



Ministry of Transport Accident Report

Herne Hill Sorting Sidings Signalbox April 1, 1960: British Railways, Southern Region

Colonel W. P. Reed, Inspecting Officer of Railways, Ministry of Transport, inquired into the collision, at 6.28 a.m. on April 1, 1960, in thick fog, between an electric passenger train and a stationary steam locomotive on the down line at Herne Hill Sorting Sidings signalbox between Loughborough Junction and Herne Hill. The passenger train involved was the 6.14 a.m. from Holborn Viaduct to West Croydon.

The motorman of the passenger train was killed; the driver of the locomotive sustained injuries which kept him in hospital for several days; and the guard of the passenger train and 12 of the 35 passengers were treated for shock and minor injuries. The emergency services were called promptly and responded at once. The circuit-breakers on the down line opened immediately when the collision occurred, and the up line was made dead 19 min. later, to facilitate recovery work.

The night had been clear until 5.30 a.m., when thick fog developed. At the time of the collision visibility was reduced to 20 yd.

At Herne Hill Sorting Sidings signalbox there is a yard on each side of the running lines, with trailing connections to both up and down tracks. There is also a crossover between the up and down lines. Sykes lock-and-block is in use between Loughborough Junction, to the rear, and Herne Hill Sorting Sidings Box.

Signalling Regulations

The Loughborough Junction signalman cannot pull off his starter until the Sorting Sidings signalman has accepted the train by depressing a plunger.

Once the latter signalman has given a "plunge," he cannot give a second plunge until he has pulled and replaced both his home and starting signals. In addition, the regulations lay down that when the signalman at the Sorting Sidings Box receives "train entering section" from Loughborough Junction, he must throw over the "switch-hook" on his instrument. Thus both which, independent of the rotation locking, puts a mechanical lock on his plunger, and so maintains at Loughborough Junction the indication, consisting of a miniature semaphore on his instrument, which shows that the section is not clear.

When the Sorting Sidings signalman has to dispose of a train into the sidings, his starting signal is not used. He has, therefore, a release key, to enable him to re-set his instrument and free his plunger.

The engine concerned in the collision was the down-side pilot engine at Herne Hill Sidings. It had been sent that morning to Camberwell, beyond Loughborough Junction, to be attached to the rear of the 5.22 a.m. Brockley Lane goods train, which had come via Nunhead and Loughborough Junction in the Nunhead direction. The pilot engine had drawn this train, with the train's own engine still attached, back to Herne Hill Sorting Sidings. It was then detached, and the train, now with its own engine, had set back over the crossover on to the up line, and then had again set back into the up-side sidings. Meanwhile the pilot engine remained on the down line waiting to set back into the down-side sidings. At this moment the collision occurred.

All these movements were normal, except that usually the up-side pilot engine is used, in which case it goes with the train over the crossover and into the up-side sidings; but when the up-side engine is not available, the down-side engine is used.

Evidence from the yard staff and the driver and guard of the freight train showed that, allowing for the fog, the disposal of the freight train into the up-side yard was carried out in a perfectly normal manner. The driver said that the train had just travelled into the up-side yard when the collision with the pilot engine occurred. A test subsequently carried out by Colonel Reed showed that the whole operation would take exactly 6 min.

Engine Whistle Signals

The yard foreman on duty stated that he heard the driver of the goods train whistle before starting to cross to the up line, but he did not hear any whistle from the driver of the pilot engine. The signalman equally denied that he had heard a whistle.

The driver of the pilot engine said that he followed the goods train after a short pause as far as the shunt signal governing his next move. This was at danger, and so he immediately sounded his whistle. As the signal did not come off, he sent his fireman to the signalbox and after an interval of 1½ min. he whistled again. A minute or two later he saw the electric train coming.

The fireman of the pilot engine said that on leaving the engine he called on his way to the box at the shunter's lobby, which he was just leaving when the collision occurred. He was sure that he had only spent a minute there, to fill his tea can. He could not say whether he had heard his driver whistle.

The signalman on duty at Herne Hill Sorting Sidings Box said that by arrangement with the relieving signalman he worked an extra half-hour, up to 6.30 a.m. This arrangement had not been reported to the station-master. He said that he was not unduly tired, but that on accepting the goods train he pulled off his home signal and then visited the lavatory. This meant that he did not carry out Rule 39(a). The latter lays down that, because, in this case, the starting signal remained "on," the train should have been checked or stopped at the home signal.

Signalling Procedure

The signalman described his actions in disposing of the goods train. As the driver of this train had gone along the up line as far as Loughborough Junction station, only about 500 yd., the signalman telephoned the station staff there to tell the driver he could set back into the up sidings.

On coming off the telephone he was offered the electric train by Loughborough Junction. Thinking that the down line was clear, he accepted it. He could not recall using his release key to free his instrument after the goods train, nor could he recall sending "train out of section" for the goods train. He did not hear the pilot engine whistle, nor did anyone come up to the box to remind him of its presence on the down line. The switch-hook must have been off the plunger when he accepted the electric train. He could not recall putting it over the plunger when he received "train entering section" for the goods train.

After accepting the electric train, he immediately offered it on to Herne Hill, and it was accepted. He then pulled off all his signals for the electric train. Just after this train had passed him, he heard a loud report. At first he ascribed this to shunting in the sidings. Only when the rear of the electric train stopped opposite his box did he suddenly remember the pilot engine on the down line and realised what had occurred.

The signalman admitted that on a number of occasions he had not turned over the switch-hook on receiving "train entering section" from Loughborough Junction, his reason being that the train passed him in a matter of seconds after this message was received. He also admitted that on previous occasions he had failed to observe Rule 39 (a).

The Loughborough Junction signalman said that he could not recall receiving "train out of section" for the goods train before he offered the electric train; but as he was dealing with two other trains at the time, he might not have heard it. He was sure, however, that when he offered the electric train, the semaphore on his block instrument was in the lowered position.

Inspecting Officer's Conclusions

Tests carried out after the accident led Colonel Reed to the conclusion that the pilot engine must have been standing at the shunt signal on the down line for at least 4 min., and probably for 5 min. before the collision. They also showed that a whistle from an engine in that position was audible in the signalbox above other noises in the yard and even when the door and windows of the box were closed.

Rule 55 lays down that when a train is brought to a stand at a stop signal, the driver must sound his whistle and in foggy weather send his fireman to the box at once, instead of waiting 2 min. Colonel Reed believes that the driver failed to whistle properly. The fireman also was dilatory, on his own admission, in going to the box. If the driver had whistled, the signalman could have heard it and would not have permitted the electric train to approach his box. If the fireman had gone quickly to the box, there would have been time for the signalman to put back his own signals against the electric train, and quite possibly to send "obstruction danger" to Loughborough Junction in time to get the train stopped there. Both driver and fireman, therefore, must bear some blame for the accident.

The main responsibility, however, rests upon the signalman, who forgot the pilot engine and released his Sykes instrument so as to accept the electric train. His other irregularities, as revealed in his evidence, did not directly contribute to his forgetfulness on this occasion, but indicate a perfunctory outlook which may have predisposed him to being less alert. Colonel Reed does not think that these omissions in procedure could have been detected by the supervisory staff.

The track circuiting in this area, Colonel Reed states, would have prevented the accident; but there is no special justification for providing it in advance of any general re-signalling scheme.

The shunt signal where the pilot engine stopped is only 76 yd. from the box, and safety, even in fog, is ensured if the men concerned do not neglect their duties. The importance of Rule 55 is illustrated by this accident, which emphasises the need to carry it out thoroughly and expeditiously, particularly in fog.

NORTH EASTERN REGION FUR & FEATHER SHOW.—The annual Fur & Feather Show organised by British Railways' Staff Association, North Eastern Region, was held in the York Railway Institute Gymnasium on November 12, 1960.

North-East London Electrification Inaugurated

Formal opening of electrified services operating on the 50-cycle a.c. system

Sir Brian Robertson, Chairman of the British Transport Commission, inaugurated the North-East London electric passenger services of British Railways, Eastern Region, on November 16. The new timetable of electric services came into operation last Monday. The 45 route-miles have been electrified at 6.25 and 25 kV, 50 cycles a.c.

On the first stage of the inaugural journey, Sir Brian Robertson travelled in the motor-man's cab. Some 300 people were on the train and groups from Chingford, Enfield Town, Hertford East and Bishops Stortford were picked up en route. After a brief stop at Harlow Town to inspect the new station, the party was welcomed back at Liverpool Street Station by Sir Bernard Waley-Cohen, Lord Mayor of London.

Sir Brian Robertson welcomed the guests at luncheon in the Abercorn Rooms of the Great Eastern Hotel, and said that the opening of electrification between Liverpool Street, Enfield, Chingford, Hertford East, and Bishops Stortford, saw the end of a period which, because of the extensive engineering work involved, had been often vexing and frustrating for the many thousands of customers who regularly used the suburban services. The B.T.C. was grateful to them for putting up with all the inevitable irritations, "but he was quite certain they would find that it had been well worth waiting for 'commuters' day.'"

Choice of Electrification

Throughout British Railways the Commission was changing over to diesel and electric traction, and the choice of electrification for some lines, and diesel traction for others, was based wholly on the density of use of the lines in question. Both forms of traction had their protagonists. On a line carrying consistently dense traffic, as on a busy suburban line, no system of rail traction

yet invented could operate so effectively or so competitively as electrification on the high-voltage a.c. system. For that reason the Commission voted confidently for electric working over the heavily-trafficked lines between Liverpool Street and Bishops Stortford, and he had no doubt at all that the results, in terms of economy, efficiency, comfort, and passenger satisfaction, would be decisively favourable.

Example to Commonwealth Countries

Mr. Iain Macleod, Colonial Secretary and Member of Parliament for Enfield West, thanked Sir Brian Robertson on behalf of the guests for the excellent entertainment and said that, as a member of the public, he rejoiced in the service that had just been inaugurated. As a Member of Parliament, he said that his constituents were delighted at the greatly improved service because nobody benefited more than they did. As Colonial Secretary, Mr. Macleod saw the new electrification as a shining example to the Commonwealth countries. As the dependent territories became independent he wanted to see a highly developed transport system. Technicians, he said, must give of their skill to overseas countries. The Government must make it possible for professional men and women of all kinds to devote their life's service to these territories. He was delighted to hear that British railwaymen had gone to Pakistan to advise on railway electrification. This was not only good management but also good business because contracts were bound to come back to the country.

Others present at the inauguration included:—

British Transport Commission: Sir John Benstead, Deputy Chairman; Sir Reginald Wilson, Mr. J. Ratter, and Mr. A. B. B. Valentine, Members; Major-General L. Wansbrough - Jones, Secretary-General;

Messrs. R. C. Bond, Technical Adviser; M. H. B. Gilmour, Legal Adviser; J. F. Harrison, Chief Mechanical Engineer; and S. B. Warder, Chief Electrical Engineer; *Ministry of Transport:* Sir James Dunnett, Permanent Secretary; and Brigadier C. A. Langley, Chief Inspecting Officer of Railways;

Eastern Area Board, B.T.C.: Major-General G. N. Russell, Chairman; Messrs. A. Macleod, A. F. Pegler, J. B. Peile, and Sir Henry Willink, Members; Mr. G. A. V. Hayes, Secretary;

London Transport Executive: Mr. A. H. Grainger, Deputy Chairman and Managing Director;

British Railways, Southern Region: Mr. D. McKenna, Assistant General Manager;

British Railways, Eastern Region: Messrs. H. C. Johnson, General Manager; Norman Hamilton, Public Relations Adviser; J. Bonham-Carter, A. W. Tait, and A. A. Harrison, Assistant General Managers; A. K. Terris, Chief Civil Engineer; T. C. B. Miller, Chief Mechanical & Electrical Engineer; R. A. Green, Signal Engineer; A. J. White, Assistant General Manager (Retired);

Messrs. W. G. Thorpe, Line Traffic Manager (G.E.); H. W. Few, Traffic Manager (Liverpool Street); M. B. Thomas, Public Relations & Publicity Officer; S. A. Claydon, Continental Traffic & Shipping Manager; P. Armstrong, Regional Establishment & Staff Officer; W. Brown, Regional Accountant; L. A. A. Taylor, Estate & Rating Surveyor; O. R. Smart, Supplies & Contracts Manager;

Messrs. L. James, Chief of Police; H. R. Gomersall, Regional Planning Officer; D. Fenton, Movement Officer; K. J. Cook, Chief Mechanical & Electrical Engineer (Retired); E. D. Trask, Assistant to General Manager (Special Duties) (Retired); C. Rowe, Regional Planning Officer; T. A. Germaine, Assistant Public Relations Officer;

Dr. A. C. Mackay, Area Medical Officer; Sister Fletcher, Medical Service;

Messrs. J. W. Grieve, Electrical Engineer (New Works); G. S. Pillans, Assistant Electrical Engineer (New Works); G. A. B. Leishman, Electric Traction Engineer (London); A. L. Selmes, Distribution Assistant (Chief Mechanical & Electrical Engineer); J. W. Woolvett, Rolling Stock Assistant (Chief Mechanical & Electrical Engineer); J. Cleaver, Construction Assistant (Chief Mechanical & Electrical Engineer); L. C. Mead, Senior Technical Assistant (Chief Mechanical & Electrical Engineer); N. Howard, Senior Technical Assistant (Chief Mechanical & Electrical Engineer); E. C. Lyon, Assistant Electric Traction Engineer (London); M. H. Davis, Resident Engineer (Electrification Contracts) (Chief Mechanical & Electrical Engineer);

Messrs. A. W. Watson, Power Supply Assistant (New Works) (Chief Mechanical & Electrical Engineer); J. Cade, Construction Inspector (Chief Mechanical & Electrical Engineer); J. R. Dallmeyer, Assistant Civil Engineer; R. E. Sadler, Assistant Civil Engineer (Modernisation); H. H. Powell, Architect; A. J. Fagg, Principal Assistant Architect; S. W. Saunders, Assistant (architect's Office); R. L. Brydon, Senior Resident Engineer (Chief Civil Engineer); C. Kaye, Senior Assistant Architect; A. I. Emerson, District Engineer, Cambridge; J. W. Sage, Chief Permanent Way Inspector, Stratford; C. H. Simpkins, Chief Works Inspector, Cambridge; F. Martin, Chief Permanent Way Inspector, Cambridge;

Messrs. H. L. F. Tuff, Assistant Signal Engineer (Modernisation); C. R. Smith, Senior Development Assistant (Signal Engineer); R. J. Phillips, Development Assistant (Signal Engineer); K. Taylor, Technical Assistant (Signal Engineer); S. H. B. Barrs,



Sir Bernard Waley-Cohen greeting the motorman of special train at Liverpool Street, with (left) Major General R. G. Russell, Sir Brian Robertson, and Mr. H. C. Johnson

Assistant to Signal Engineer (Telecommunications); D. G. Handley, Assistant (Development) Telecommunications; G. F. Bloomfield, District Signal Officer, Stratford; J. C. Rowell, District Signal Officer, Norwich; L. Warner, Inspector (Signal Engineer), Stratford; E. R. Meeney, Technician (Signal Engineer), Stratford;

Messrs. J. Meanley, Technician (Signal Engineer), Stratford; L. A. Pearce, Technician (Signal Engineer), Cambridge; D. Peach, Instrument Mechanic (Signal Engineer), Retford; G. Coaker, Movement Superintendent, Line Traffic Manager (G.E.); R. A. Long, Commercial Superintendent, Line Traffic Manager (G.E.); C. Scutt, Motive Power Officer, Line Traffic Manager (G.E.); D. A. Farrell, Public Relations Officer, Line Traffic Manager (G.E.); G. Papworth, Line Traffic Manager (G.E.); W. Hannon, Motive Power Inspector, Line Traffic Manager (G.E.); H. Kinsey, District Commercial Officer, Traffic Manager (Liverpool Street); G. M. Booth, District Operating Superintendent, Traffic Manager (Liverpool Street); R. H. N. Hardy, District Motive Power Officer, Traffic Manager (Liverpool Street);

Messrs. J. W. Ind., Managing Director, Leonard Fairclough (London) Limited; F. H. Burnell, Director, W. & C. French Limited; D. F. Cox, Director, Haymills (Contractors) Limited; M. Morgan, Director, Higgs & Hill Limited; R. G. Norman, Director, Holliday & Greenwood Limited; J. N. Jackaman, Director, A. Jackaman & Son Ltd.; J. E. Kelly, Managing Director, Wellerman Bros. Ltd.; A. B. Holmes, Managing Director, Holmpress Piles Limited;

Sir William McFadzean, Chairman, British Insulated Callender's Cables Limited; Messrs O. J. Crompton, G. A. Wallace, and J. Gates, British Insulated Callender's Construction Co. Ltd.; Messrs. D. G. Denoon and E. L. Fairclough, British Insulated Callender's Cables Limited; F. A. Manley, General Electric Co. Ltd.; G. T. D. Ingle, Fuller Electric Limited; A. C. Beck, Standard Telephones & Cables Limited; G. J. Reeves, South Wales Switchgear Limited.

Messrs. M. W. Shorter, T. J. Aldridge, C. F. D. Venning, J. P. Loosemore, R. C. Batter, and E. M. Tanner, Westinghouse Brake & Signal Co. Ltd.; F. Limb, Ericsson Telephones Limited; and R. J. Willoughby, Pirelli-General Cable Works Limited.

Signalling Developments in Germany

The early expansion in manufacture of signalling equipment was referred to in a paper entitled "The development and application of new methods of signal engineering in Germany" read to the Institution of Railway Signal Engineers at its November meeting by Dipl. Ing. Karl Friedrich Kümmell (Member), German State Railways. Herr Kümmell described the various types of mechanical interlocking which had been developed and how, after the second world war, the German Railways turned attention to electrical systems which had brought with them the benefits of central operation and reduction in operating staff.

Route relay interlocking, on the geographical system, was introduced at Düsseldorf in 1948 and in 1950 a number of mass-produced types were put into service. About 400 route relay interlockings were built to replace some 900 old type mechanical installations but this was considered a small portion of the total of 10,500 interlocking frames on the German Railways. The balance would eventually be replaced by geographical inter-

lockings known in Germany as push-button locking frames.

The geographical system had been extended to larger stations together with the remote control of junctions. The first experiment was taken in 1954 when a junction point outside Wiesbaden was connected to the main station to control trains operating on a close headway over a section of three track line 3km. long. In 1957 a large installation of this type came into operation at Frankfurt am Main.

Automatic Control of Rail Brakes

Herr Kümmell stated that rail brakes and some form of programme storing were introduced in marshalling yards about 30 years ago. After the war the storage system for automatic point operation was improved and research carried out with regard to the automatic control of the rail brakes. Measurement of weight and rolling resistance of wagons was also developed.

In conclusion he said that the automatic control of many railway operations had been possible because vehicles were confined to rails. In all other forms of transport in which vehicles were able to move freely over surface or space, some sort of contact must be provided as a substitute for the rails as a means of controlling the vehicle automatically. If the schemes envisaged for controlling even the motive power of trains by the action of signalling equipment or other automatic devices, independent of any human agency, proved successful, the railways could look forward to a future in which automatic equipment took over all the repetitive work at present undertaken by the control personnel whose only remaining duties would be to check any deviations from the preset programme and initiate any special procedures.

Buffet Bar at Colchester Station

The buffet illustrated on this page is part of the reconstruction work now in progress at Colchester Station in the Eastern Region of British Railways.

The bar was opened recently on Number 1

platform. Central features of the new refreshment room are eight 4½-ft. x 2-ft. tables fitted with Waverite tops and specially-designed Waverite pictorials illustrating many examples of Roman coins found in the vicinity of Colchester. These pictorials are echoed in the 25-ft. long service counter which is panelled with another exclusive Waverite pictorial based on Roman and mediaeval figures. Both designs are in black on a white background, and are fully protected against dirt by the Waverite process which incorporates original artwork (or copies thereof) in the laminated plastics material, and gives a top finish of clear, hard, glossy melamine.

Like the rest of the new station, the bar was designed by Mr. H. H. Powell, Regional Architect, under the general direction of Mr. A. K. Terris, Chief Civil Engineer, Eastern Region, British Railways. The main contractors are Holliday & Greenwood, London, and the Waverite pictorials were designed by Mrs. Muriel Nicol.

L.T.E. District Line Resignalling

The fifth and last stage of the resignalling work at the eastern end of the London Transport Executive District Line was completed on November 13 when new signalling of L.T.E. standard two-aspect type was brought into use over a further 2½ miles of route.

The first four stages covered the route from Campbell Road Junction, east of Bow Road, to a point between Dagenham East and Elm Park and the section just completed carries the new signalling to just east of Upminster Bridge. The signalling of the Upminster area, which starts at this point, is already controlled from a London Transport signalbox brought into use in 1958. The existing British Railways, Eastern Region, signalling was taken out of use on November 12, and the L.T.E. signalling came into service in time for the start of traffic the following morning.

Points and signals at Hornchurch, where there is a crossover, are operated from an interlocking machine housed in a room at



Service counter in the reconstructed refreshment room at Colchester Station

Hornchurch Station. The interlocking machine is controlled remotely from additional push-buttons installed on the existing control desk at Upminster Signalbox and the illuminated diagram in that box has been extended to include the Hornchurch area. When no special train movements are in progress at Hornchurch, the signals can be switched to automatic working and the normal through services can operate without the intervention of the Upminster signalman.

The completion of the resignalling work, part of the £2,500,000 modernisation and improvement plan for the Upminster Line, means that all signalling on the 12½ route miles of track east of Bow Road is now either automatic or controlled from one of London Transport's two new signalboxes at Barking and Upminster.

Interference Protection

At all stages of the signalling work, precautions have been taken to avoid interference from the 50-cycle alternating current to be used for traction purposes on British Railways' London, Tilbury & Southend line which runs alongside the District Line tracks.

The modernisation work at the eastern end of the District Line, now virtually completed, has included the building of a £1,000,000 rolling stock depot at Upminster, brought into use at the end of 1958; the building of two electrical sub-stations; and the construction of an additional platform at Upminster to compensate for the exclusive use by District Line trains of the former Romford Branch platform.

Segregation of Services

The District Line modernisation has been carried out over the last four years in conjunction with the electrification of the Eastern Region London, Tilbury & Southend Line, a feature of which has been the complete segregation of London Transport and British Railways services by flyunders and flyovers built by the Eastern Region at Barking.

Parliamentary Notes

Railway Superannuitants: New Pressure

A Motion is tabled in the House of Commons, sponsored by Conservatives, and supported by Conservatives and Labour signatories calling for new measures for raising the benefits of railway superannuitants which will be debated when the railway reorganisation plan comes before Parliament shortly.

It is in the following terms:—

"That this House, recognising that the resources of Railway Superannuation Funds have been insufficient to preserve the real purchasing power of the rates of benefit paid to members of such funds and totally inadequate to ensure that railway superannuitants received a share in the growing prosperity of the nation, as have National Insurance superannuitants, requests H.M. Government to include in their plans for the reorganisation of British Railways measures to alleviate the economic plight of railway superannuitants."

Railway Debates in the House of Lords

Lord Morrison of Lambeth is to call attention in the House of Lords, on December 7, "to the present and future problems of transport within the United Kingdom."

Earl Stanhope, on a date not yet fixed, is to call attention "to the defeatist policy of the British Transport Commission in regard to railways in abolishing such services

as do not at present show a profit, as exemplified by the proposal to close the Dunton Green-Westernham Branch Line."

Questions in Parliament

Transport of Coal by Rail

Mr. N. Dodds (Erith and Crayford—Lab.-Co-op.) asked the Minister of Power on November 21 what action had been taken to ensure that a satisfactory flow of household coal is maintained to south-east London and north-west Kent during the winter months, in view of the unsatisfactory situation experienced last winter when coal which left Midland collieries early in December was not received by the merchants until February.

Mr. W. J. Owen (Morpeth—Lab.-Co-op.) asked what discussions he has had with the British Transport Commission concerning the conveyance of adequate supplies of domestic coal; and what steps are being taken to ensure that adequate supplies of coal are distributed to meet the needs of consumers.

Mr. Richard Wood: The British Transport Commission and the National Coal Board are making special arrangements, and diverting some traffic to the roads, to deal with the winter coal demand. The two industries are in constant touch, and I understand that British Railways is now moving about 200,000 tons of coal a week more than last year.

Mr. Dodds: Is the Minister satisfied that everything is being done?

Mr. Wood: I am aware of the difficulties of last year, but British Railways is moving a great deal more coal this year. Arrangements have been made to enable quite a lot of coal to be moved by road to the power stations, thus freeing the facilities for the movement of other coal.

Mr. J. T. Stonehouse (Widnesbury—Lab.): Will the Minister consider an emergency plan in special circumstances?

Mr. Wood: The British Transport Commission and the National Coal Board are holding weekly meetings to review the winter position. There is consultation not only at headquarters but also at divisional level. All these consultations are being held to meet the kind of difficulties which hon. Members have in mind.

B.T.C.'s Reply to Recommendations

Mr. R. Mellish (Bermondsey—Lab.) asked the Minister of Transport on November 16 when he expected to receive the reply of the British Transport Commission to the recommendations of the Select Committee on Nationalised Industries which recently inquired into the financial structure of British Railways.

Mr. Ernest Marples, in a written answer: Shortly, Sir.

CONVERSION OF FREIGHT DEPOT.—British Railways, North Eastern Region, has announced that the freight depot at St. Johns Chapel, on the Wearhead branch, will be converted to a public delivery siding on January 2, 1961. Parcels will be collected and delivered by British Railways' road motors based at Bishop Auckland and Wolsingham and parcels not requiring cartage will be dealt with at Stanhope Station. Full wagon load freight traffic not requiring cartage by British Railways will continue to be dealt with at the public delivery siding and small consignments of freight traffic requiring cartage by British Railways will be dealt with by road motors based at Wolsingham and Stanhope.

Staff and Labour Matters

Underground Hours

A meeting was held on November 15, between the London Transport Executive and representatives of the three railway unions to discuss union claims for a shorter working week. The Executive informed the unions that, at this stage, it could not concede their demands, which concerned about 14,000 staff, including drivers and guards, on the London Underground.

The claim was first submitted earlier this year. The N.U.R. and A.S.L.E.F. asked for a reduction from 44 to 40 hr. a week, and T.S.S.A. wanted a 38-hr. week instead of the present 42-hr. week, for booking clerks and supervisory and control staff.

Last August, the British Transport Commission rejected a similar claim for the 500,000 employees on the main lines, and this is now awaiting consideration by the Railway Staff National Council, the second stage in the negotiating procedure. The case of the L.T.E. staff is expected to come up again after the main-line claim is decided.

Workshop and Electrical Staff Pay

Agreement has been reached between the British Transport Commission and the trade unions concerned under which revised rates of pay operative from January 11, 1960, have been agreed for railway workshop supervisory staff and railway electrical staff. Both these sections of staff received an increase of 5 per cent from January 11, 1960, and the increases now granted are broadly in line with those granted to other groups of railway staff.

REDUCTION IN CHANNEL ISLAND SEA FARES.—British Railways, Southern Region, has announced that fares on the new steamer services to the Channel Islands, which start next May, are to be reduced. The new one-class return fare between Weymouth and either Jersey or Guernsey will be £4 14s. 6d., £2 15s. below the present first class fare and 11s. less than the second class fare.

CLOSURE OF LOUTH-MABLETHORPE LINE.—British Railways, Eastern Region, has announced that from December 5, 1960, passenger and freight train services will be withdrawn between Louth (exclusive) and Mablethorpe (exclusive). Grimoldy, Saltfleetby and Theddlethorpe stations will be closed completely, passengers being catered for at Louth and Mablethorpe, and by buses operating in the area. Collection and delivery services for parcels and freight sundries traffic will be continued by road motors at Louth and Mablethorpe. Consignments in full wagon loads will be dealt with at Louth, Mablethorpe and Sutton-on-Sea.

BRITISH INSULATED CALLENDER'S CABLES LIMITED FILMS.—British Insulated Callender's Cables Limited presented two films, "Power to the Pantograph" and "The First A.C. Railway Electrification in India," at the British Council Film Theatre, Hanover Street, London, on November 15. "Power to the Pantograph" presents a detailed picture of the planning, design, manufacture, and installation of a.c. overhead equipment for British Railways. It is in colour, runs for 32 min., and is available in both 35 mm. and 16 mm. "The First A.C. Railway Electrification in India" illustrates the installation techniques adopted to make full use of available man-power for India's first 25-kV. 50-cycles a.c. electrification scheme. It is in colour, runs for 18 min., and is available only in 16 mm.

Contracts and Tenders

Diesel-hydraulic locomotives for Victorian Government Railways

The Victorian Railways has placed an order with Tulloch Limited, New South Wales, for a further 25 "W" class 650-h.p. diesel-hydraulic locomotives. The total cost will be some £1,000,000. The first delivery will be made in March, 1961.

Powell Duffryn Engineering Co. Ltd. of Cardiff has been awarded a contract valued at some £90,000 for the construction of 50 rail tank wagons for the Esso Petroleum Company. The wagons weigh 35 tons, and are for the conveyance of Class "A" liquids. They are fully fitted for fast traffic and will have scroll iron type suspensions with auxiliary rubber springs. In addition to the conventional syphon pipe, they will be fitted with bottom charge and discharge.

John Baker & Bessemer Limited has received a contract to the value of £100,000 from the National Railways of Mexico for the supply of a year's requirements of solid rolled steel wheels.

The Emu Bay Railway Company of Tasmania has placed an order with Tulloch Limited of Rhodes, New South Wales, for three B-B diesel-hydraulic freight locomotives of 800 h.p. and 50 ton weight for operation on its 3-ft. 6-in. gauge railway.

Officine Meccaniche Pistoicis has begun delivery to the Interfrigo Company of 200 standard IF refrigerated wagons, 20 type IF-EI-FV, and 80 type IF-EI.

British Railways, London Midland Region, has placed the following contracts:—

Leonard Fairclough Limited: construction of new road motor depot workshop in the parcels depot at Wavertree, Liverpool
Mellowes & Co. Ltd.: patent glazing of shed roof of motive power depot at Springs Branch, Wigan

British Challenge Glazing Company: renewal of roof coverings at Llandudno Junction Passenger Station

Davis, Watson & Elliotts Limited: resurfacing of roadways at Birmingham Curzon Street Goods Depot and resurfacing and drainage of Goods Yard at Aston Goods Depot, Birmingham

Sir Alfred McAlpine & Sons Ltd.: new office and amenity block at Walsall Freight Terminal

Eagre Construction Co. Ltd.: laying-in of permanent way at Carlisle Marshalling Yard

J. Rata & Co. Ltd.: renewal of machine shop roof and general repairs at Sheeting Stores, St. Helens Junction.

British Railways, Scottish Region, has placed the following contracts:—

H. M. Murray & Co. Ltd.: new under-bridge, Golf Road level crossing, Brora

Limmer & Trinidad Lake Asphalt Co. Ltd.: reinstatement of asphalt footpath for Post Office cables, Forth Bridge

James Sim Limited: renewal of superstructure, over bridges Nos. 99, 110, and 114 on the line between Neilston High and Patterson.

The Export Services Branch, Board of Trade, has received calls for tenders as follows:—

From South Africa:

2 petrol driven, sleeper removal and insertion machine, for the insertion and removal of hardwood railway sleepers in

stone ballast on 3-ft. 6-in. gauge track as per specification.

The issuing authority is the Stores Department, South African Railways. Bids in sealed envelopes, endorsed "Tender No. F.8479 Sleeper Removal and Insertion Machines," should be addressed to the Chairman, Tender Board, P.O. Box 7784, Johannesburg. Local representation is essential. The closing date is December 15, 1960. The Board of Trade Reference is ESB/30419/60.

From Pakistan:

6 axles steel engine bogie

12 axles steel engine bogie, driving cranked.

The issuing authority is the Chief Controller of Stores, Eastern Bengal Railway, Pahartali, Chittagong, to whom bids should be sent. The tender No. is P6/EA1/BG/25/60/ATW/ACST. The closing date is December 15, 1960. The Board of Trade reference is ESB/30058/60.

1,680 tubes steel solid drawn boiler P and R Class, 12 ft. 1 in. x 1½ in., to CME/PHT's drawing No. 2-A-43, alt. 4

150 tubes steel flue PS and RS, 12 ft. 1 in. x 5½ in., to CME/PHT's drawing No. 2-A-18, alt. 2.

The issuing authority is the Chief Controller of Stores, Eastern Bengal Railway, Pahartali, Chittagong, to whom bids should be sent. The tender No. is P6/EA1/MG/27/60/ACST. The closing date is December 15, 1960. The Board of Trade reference is ESB/30057/60.

180 spring steel bearing laminated engine front bogie PS & RS 16 plated to drg. No. E7581/84 alt 3 showing figs: A & page 15B of book No. 4.

The issuing authority is the Chief Controller of Stores, Eastern Bengal Railway, Pahartali, Chittagong, to whom bids should be sent. The tender No. is P6/EA1/18/60. The closing date is December 15, 1960. The Board of Trade reference is ESB/30059/60.

2 sliding, surfacing and screw cutting lathes standard equipments

1 4 jaw chucks 12 in. dia. independent 1 taper turning attachment.

The issuing authority is the Chief Controller of Stores, Eastern Bengal Railways, Pahartali, Chittagong, to whom bids should be sent. The tender No. is P6/C/57/60. The closing date is December 8, 1960. The Board of Trade reference is ESB/30056/60.

From Thailand:

80 wheels and axles according to drg. No. P1-2139

180 spherical roller bearings S.K.F. No. 23220 CK/C3

32 spherical roller bearings S.K.F. No. 23220 K

16 spherical roller bearings S.K.F. No. 23224 CK/C3

230 withdrawal sleeves S.K.F. No. AH.3220N

40 withdrawal sleeves S.K.F. No. AH.2320

24 withdrawal sleeves S.K.F. No. AHX.3224/110

148 cast steel axleboxes according to drg. No. P2-2192

12 cast steel axleboxes according to drg. No. 5GM2-1003

8 cast steel axleboxes according to drg. No. 1GV2-1002.

The issuing authority is the State Railways

of Thailand, Yod-Se to whom bids should be sent with a deposit of Tcs. 18,000. The tender No. is 03411. Drawings may be obtained from the State Railways of Thailand at a cost of Tcs. 100 per set. A copy of the specification only is available at the Board of Trade. The closing date is December 6, 1960. The Board of Trade reference is ESB/30084/60.

1,000 superheater tubes for locomotive per drawing No. 351 S3-2008/1

1,000 superheater tubes for locomotive per drawing No. 380 S3-2086/1.

The issuing authority is the State Railway of Thailand, Yod-Se, to whom bids accompanied by a deposit of Bht. 5,000-00 should be sent. The tender No. is 03413. Drawings may be obtained from the State Railway of Thailand at a cost of Bht. 20 per set. Copies of the specifications only are available at the Board of Trade. The closing date is December 13, 1960. The Board of Trade reference is ESB/30083/60.

From Greece:

40 steel beams in lengths of 12 m.

32 wide flanged beams in lengths of 12 m.

4 wide flanged beams in lengths of 13 m.

The issuing authority is the Purchasing Department, Hellenic State Railways (S.E.K.), 34 Themistocleous Str., Athens, to whom bids should be sent. The tender No. is 4862. The closing date is December 2, 1960. The Board of Trade reference is ESB/30481/60. No further information is available at the Board of Trade.

1 grinding machine for grinding injector nozzles of diesel engines.

The issuing authority is the Purchasing & Stores Department, Hellenic State Railways (S.E.K.), 12b Polytechniou Street, Athens, to whom bids should be sent. The tender No. is 4853. The closing date is November 29, 1960. The Board of Trade reference is ESB/30480/60.

From Victoria:

800 axleboxes, cast steel, roller bearing.

The issuing authority is the Secretary, Victorian Government Railways, Melbourne, C.1, to whom bids should be sent. The contract No. is 61826. The closing date is December 7, 1960. The Board of Trade reference is ESB/30456/60.

From Sudan:

30 H.P.M.V. side road lantern fittings complete with G.E.S. lampholders, control gear and brackets suitable for fixing on top of concrete poles 6 in. x 9 in. at lamp level. Each fitting should include:

1 400 W. solid filled choke

1 20 mfd. capacitor

2 fuses

1 230-240 V. 400 W. G.E.S. clear MA/V/H.P.M.V. lamps.

The issuing authority is the Controller of Stores, Sudan Railways, Stores Department, Atbara, to whom bids should be sent. The tender No. is 2255. The closing date is December 26, 1960. The Board of Trade reference is ESB/29438/60. No further information is available at the Board of Trade.

Further details relating to the above tenders together with photo-copies of tender documents, unless otherwise stated, can be obtained from the Branch (Lacon House, Theobald's Road, W.C.1).

Notes and News

Change of Name.—The Electric Resistance Furnace Co. Ltd., a member of the Efco group of companies, is to change its name to Efco Furnaces Limited from December 1.

Westerham Line Closure Postponed.—The closure of the British Railways Southern Region line to Westerham, Kent, is to be postponed while the matter is referred to the London Transport Users' Consultative Committee. The decision to defer the closure followed a protest by local authorities. The line is used daily by about 150 regular passengers.

L.T.E. Bus and Rail Fare Increases.—The London Transport Executive has announced that certain road and rail fares are to be increased on January 15, 1961, to help meet higher costs of more than £4,000,000 a year which have arisen mainly from wage increases to London Transport bus and rail staff. Pending a public inquiry, the Transport Tribunal has given approval, where necessary, under Section 23 of the Transport Act, 1953, for these fare increases which are expected to bring in about £2,750,000 a year.

Improved Track Pads for Smith Excavators and Crawler Cranes.—A major improvement is being introduced by Thomas Smith & Sons (Rodley) Ltd. to its "21" excavators and crawler cranes. This takes the form of a re-designed track pad of 30 in. width, which will effect a marked reduction in track pin, track lug and tumbler wear. As a result, adjustment of track tension will be required less frequently with the new design. The re-designed track pad, which is to replace the previous 30 in. type, offers several advantages. It has a multi-lug hinge providing 250 per cent more bearing area, as well as being more rigid, and incorporates a design feature which eliminates any form of jerky travel action.

Combined Machine Tool Research.—David Brown Industries Limited and Electrical & Musical Industries Electronics Limited have announced that their joint programme of research and development into the problems of applying electronic techniques to machine tools will be continuously expanded to use fully the technical and engineering resources of the two companies. This joint develop-

ment began before the publication of the recent White Paper on the machine tool industry and the companies have already put into practice the recommendation that research should be carried out in industry by joint teams of machine tool and control system engineers.

Dean & Dawson Limited Overseas Reception Centre Closure.—The Overseas Reception Centre of Dean & Dawson Limited in Bolton Street, Mayfair, closed on October 31. The service was transferred to the Overseas Reception Centre of Thos. Cook & Son Ltd., Berkeley Street, London, W.1. After the transfer, Mr. Dunn, the Manager, together with the other staff, joined the staff of Thos. Cook & Son Ltd. at Berkeley Street.

Visitors to Britain in September.—Overseas visitors to Britain in September totalled more than 168,000. This figure has brought the number of arrivals in the first nine months of the year to almost 1,396,500; more than the total for the whole of 1959, and an increase of 21 per cent over the same month last year. The total for the nine months January to September represents an increase of 19 per cent on the period.

Closure of Wearhead Freight Depot.—British Railways, North Eastern Region, has announced that because of the loss which is being incurred the freight depot at Wearhead will be closed on January 2, 1961. Approval for this measure has been given by the Transport Users' Consultative Committee for the North Eastern Area. Parcels will be collected and delivered by British Railways' road motors based at Bishop Auckland and Wolsingham. Parcels traffic not requiring cartage by British Railways will be dealt with at Stanhope and Wolsingham Stations. Full wagon load freight traffic not requiring cartage by British Railways will be dealt with at St. John's Chapel Public Delivery Siding, while traffic requiring cartage by British Railways will be conveyed to or from the freight depots at Wolsingham or Stanhope.

Engine Nameplate for Huddersfield Town Football Club.—Mr. E. E. Cowell, Traffic Manager (West Riding), North Eastern Region, recently presented the nameplate

of "B17" class 4-6-0 locomotive *Huddersfield Town* on behalf of British Railways to Huddersfield Town Football Club. The presentation took place at the club's offices. The illustration shows (left to right): Mr. Cowell, Alderman N. Day, Mayor of Huddersfield, and Mr. S. D. Lister, Chairman of Huddersfield Town Football Club.

Peter Brotherhood Limited Results.—Net profits of Peter Brotherhood Limited, machinery and power plant manufacturers, for the year ended March 31, 1960, showed a slight change compared with the previous 12 months, although the dividend is being held at 25 per cent with an unchanged final payment of 20 per cent. Net profits amounted to £268,859 compared with £280,204 for 1958-59.

The United Steel Companies Limited Record Output.—Steel output of the United Steel Companies Limited at 3,284,170 tons was a record during the year ended September 30, 1960. It exceeded the previous year's output by 27 per cent. Pig iron production also reached a new high level of 2,008,094 tons, compared with 1,757,413 tons in 1958-59. Records also were established for iron ore and coke production. All the steel-making branches of the company contributed towards these results.

Factory Removal by Rail.—Lightalloys (Willesden) Limited, which forms part of the Manganese, Bronze & Brass Group, is transferring the bulk of its works by rail to Deans & Son (Yorkshire) Ltd. of Beverley, near Hull, a member of the group. It is estimated that the move will involve some 250 wagon loads of traffic. The remainder of the works is to be moved to Stevens & Struthers Limited, Glasgow, and to The Manganese, Bronze & Brass Co. Ltd., Ipswich.

Serck Radiators Limited Decline in Profits.—The group profits of Serck Radiators Limited have fallen to £597,882 (after tax), from £693,005. Ordinary shareholders are to get a final of 4½d. a 5s. share, which, allowing for a one-for-two scrip issue, raises the dividend to 7½d. from the equivalent of 7d. a share, but last time on the old capital there was an extra distribution of 1½d. a share. Features of the year have included an increased turnover, reduced profit margins, and heavy development expenditure.

Drivers Endangered by Schoolchildren.—At a press conference in London in support of an appeal to parents and schoolteachers to help prevent accidents and damage caused by children throwing stones, bottles, fruit and other missiles at the driving cabs of passing locomotives and multiple-unit trains, it was stated that the practice, which has increased this year, constituted a very serious danger to drivers. There had been many cases of drivers escaping, only by luck, the loss of their jobs through permanent eye injury. Recently two boys short-circuited the newly-electrified lines between Chesham and Chalfont, Metropolitan Line, London Transport Executive, by throwing a coil of wire across them. The resultant cancellations and diversions affected seven trains and 220 passengers.

Toledo Woodhead Springs Limited Rights Issue.—Toledo Woodhead Springs Limited has announced that it will shortly be making a rights issue to raise £225,000. The money is needed to execute further developments in the current year. A circular on the rights offer will be sent out with the report and accounts on November 1. Group net profits, after tax and a transfer of £10,500 to plant



Presentation of locomotive nameplate to Huddersfield Town Football Club

replacement reserve, expanded in the year ended August 28 to £59,125, from £45,779 previously. The total dividend amounted to 20 per cent (17½ per cent) with a final payment of 12½ per cent.

Toledo Woodhead Limited Group Profit.—Mr. Frank Woodhead, Chairman of Toledo Woodhead Limited, states that the trading profit for the Toledo Woodhead group for the past year is £170,487 before deduction of depreciation. This represents a 70 per cent improvement compared with the previous year's result. The annual general meeting of the company is to be held today, November 25 at Coronation Works, Aycliffe, Co. Durham.

A.E.I. Export Limited Management Changes.—The export company of Associated Electrical Industries Limited, A.E.I. Export, Limited which was formed in 1959, now has a single managing director instead of three joint managing directors. Mr. F. R. Mason has been appointed Managing Director. Mr. E. V. Small, who was one of the three Joint Managing Directors, has retired from executive work with the export company and is appointed Consultant, and Mr. B. A. Hensler, previously Joint Managing Director, will continue as a director.

First Aid Awards.—Awards and certificates were presented to four railway first aiders by Mr. David Blee, General Manager, British Railways, London Midland Region, in the boardroom at Euston Station on November 18. The men and their awards were: Messrs. G. A. Hartland, Inspector, Birmingham New Street, canteen of cutlery; J. Sorrell, Inspector, Birmingham New Street, Goblin Teasmade combined clock and tea making machine; J. Harper, Police Sergeant, Heysham, wristlet watch; G. W. Gilpin, Police Constable, Heysham, wristlet watch.

Allen West & Co. Ltd. at the British Trade Fair in Moscow.—Electric motor control gear manufactured in Brighton by Allen West & Co. Ltd. will be among the special exhibits at the British Trade Fair in Moscow next summer. This fair, the largest foreign fair ever to be held in the Soviet Union, will occupy a 23-acre site in the Sokolniki Park



New Freight Depot at Watford under construction

of Culture & Rest, and will be staged from May 19 to June 4 in four exhibition halls as well as in the open. Two of the halls were built for the United States National Exhibition last year, and two more are to be built for the British Fair and for the French National Exhibition which follows it.

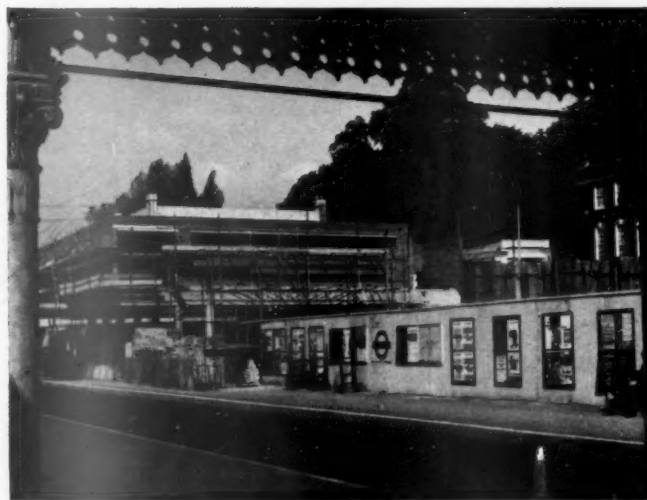
Freight Depot at Watford.—Reproduced on this page is a progress photograph of the new freight terminal at Watford in the London Midland Region of British Railways. The depot will include offices and staff amenities, sidings for marshalling wagons, and two sheds for Received and Sundries traffic. Modern handling equipment will include a 475-ft. slat conveyor, an overhead gantry crane with a 58-ft. span, and a mobile crane.

Increase in Passenger Fares to Ireland.—As a result of the wage increase following the recent seamen's strike and other substantial increases in working expenses, British Railways is forced to raise passenger

fares on its shipping routes between Great Britain and Ireland from December 1. The fare increase for a single journey between Stranraer and Larne is 6d. and between Heysham and Belfast, Holyhead and Dun Laoghaire, and Fishguard and Rosslare, 2s. These will apply to second and first class alike, in both directions, and there will also be slight increases in the charges for sleeper berths and cabin accommodation.

British Insulated Callender's Cables Limited Results.—Group sales of British Insulated Callender's Cables Limited in the half-year ended June 30, 1960, were £11,000,000 higher at £74,000,000 compared with the corresponding six months of 1959. The interim dividend is again 4 per cent. The total for 1959 was 13½ per cent. Net profits for the six months to June 30 amount to £1,748,000. The total of the previous half-year was £1,791,000 and that for the second half of 1959 £1,740,000. Sir William McFadzean, the Chairman, reports that the profit position on both low voltage power cables and

Improvements on L.T.E. Metropolitan Line



New booking hall at Northwood Station, Metropolitan Line, London Transport Executive, seen from below original canopy on platform



Widening cutting and excavation work for drainage of new bed for two additional tracks near Northwood

wiring and general cables has been unsatisfactory. A large proportion of power cable business is handled under annual contracts and the full effect of the severe price cuts which took place in the middle of last year has been felt in the half-year under review.

A Paper on Rheostatic Braking.—At a general meeting of the Institution of Locomotive Engineers on Tuesday, December 6, at 5.30 p.m., a paper on "Rheostatic Braking for Multiple-Unit Trains" will be presented by Mr. J. H. Cansdale and Mr. G. Collins. Among the topics examined in the paper are the fundamental concepts of rheostatic braking, existing installations, and the possibilities of using rheostatic brake energy for coach heating.

London Midland Region Goods Depot to Close.—London Midland Region, British Railways, has announced that Liscard & Poulton and Mauldeth Road for Withington Goods Depots will be closed on December 5, 1960. Traffic for Liscard & Poulton will be dealt with at Morpeth Dock Birkenhead or Birkenhead North. Mauldeth Road will be leased to the Manchester & Salford Co-operative Society for use as a coal concentration depot. Traffic, except coal, will be dealt with at Manchester main stations or Fallowfield. Coal for Manchester & Salford Co-operative Society and W. H. Kynaston will continue to be handled at Mauldeth Road and other coal traffic at stations as consigned by senders.

Forthcoming Meetings

- November 26 (Sat.).—The Railway Club. Annual Dinner at the Danish Club.
- November 27 (Sun.).—The Railway Correspondence & Travel Society. Annual re-union at Birmingham.
- November 29 (Tue.).—British Institute of Management, at Connaught Rooms, London, W.C.2. One day conference on the selection of senior executive staff.
- November 29 (Tue.).—The Institute of Transport, at London Airport Control Tower, at 6.30 p.m. "Airline Advertising," Mr. A. Burkart.
- November 29 (Tue.).—The Institute of Mechanical Engineers, 1, Birdcage Walk, London, S.W.1, at 6 p.m. "Gear Materials and their Treatment," discussion.
- November 29 (Tue.).—Institute of Traffic Administration, Mersey Branch, at Stork Hotel, Liverpool, at 7.30 p.m. "The Port of Liverpool," Mr. G. Smallwood.
- November 29 (Tue.).—The Institution of Civil Engineers, Great George Street, London, S.W.1, at 5.30 p.m. Symposium of Management; Sir Leonard Owen, Professor J. F. Baker, Sir Ewart Smith, Colonel S. M. Lovell.
- November 30 (Wed.).—Institute of Traffic Administration, Devon & Cornwall Branch, at S.W. Gas Board Theatre, Plymouth, at 7.15 p.m. Address by Superintendent J. Normington, Plymouth Police Traffic Department.
- November 30 (Wed.).—The Institution of Mechanical Engineers, 1, Birdcage Walk, London, S.W.1, at 6 p.m. "Economic Results of Diesel-Electric Motive Power on the Railways of the United States of America," Mr. H. F. Brown.
- November 30 (Wed.).—British Railways, Southern Region, Lecture & Debating Society, at the Chapter House, St. Thomas's Street, London, S.E.1, at 6 p.m. Members' papers, and film.

December 1 (Thu.).—Society of Chemical Industry, at Olympia, London, W.14, at 2 p.m. "The Influence of Water Movement on Corrosion," Dr. G. Butler and Dr. N. V. Nowlan.

December 1 (Thu.).—British Railways (Western Region) London Lecture & Debating Society, Headquarters Staff Dining Club, Paddington, at 5.45 p.m. "The Work of the B.T.C. Film Unit," Mr. E. Anstey.

December 2 (Fri.).—The Railway Club, at Royal Scottish Corporation, at 7 p.m. "The Great Central Railway," Mr. Woodruffe-Peacock.

December 2 (Fri.).—The Institute of Transport, South Western Section, at Imperial Hotel, Exeter, at 12.30 p.m. Annual Luncheon and Visit of President.

December 2 (Fri.).—The Railway & Canal Historical Society, East Midlands Group. "The Stamford Canal," Mr. J. M. Palmer.

December 3 (Sat.).—The Historical Model Railway Society at Euston Hotel. Annual General Meeting, and Tenth Anniversary Dinner.

Railway Stock Market

There has been a better undertone in stock markets because of the prospect that during the next few months millions of the money to be paid out to Ford Motor shareholders will be reinvested in leading industrial shares. Nevertheless, caution was the predominating influence, despite talk of a coming reduction in bank rate to 5 per cent and hopes of some easing of H.P. restrictions.

Among Foreign Rails, Costa Rica ordinary stock lost a point at 35½, but the first debentures improved from 94½ to 95½ and the second debentures from 110 to 112½. Moreover, Chilean Northern first debentures were 53½, compared with 52½ a week ago.

Antofagasta ordinary stock remained at 16, while the preference improved fractionally to 33½. San Paulo Railway 3s. units kept at 1s., United of Havana consolidated stock at 6, and Brazil Railway bonds were 5½, or slightly higher than a week ago. Mexican Central 'A' bearer debentures were firm at 60. International of Central America shares at \$26 and the preferred at \$103½ held the same quotations as a week ago.

Midland of Western Australia ordinary stock changed hands up to 7½. Nyasaland Railways shares were 9s. and the 3½ per cent debentures 40xd. Gedaref Railway & Development 5 per cent guaranteed debentures were quoted at 96.

Canadian Pacifics have reacted from \$39½ a week ago to \$38½, while the 4 per cent preference stock came back from 61½ to 59½, at which there is a yield of 6½ per cent, and the 4 per cent debentures eased from 63½ to 61½. White Pass shares were again at \$10½. West of India Portuguese stock at 110½ had the same quotation as a week ago.

Among shares of locomotive builders and engineers price changes were again small, but a feature was a rise from 18s. 6d. to 19s. 9d. in Wagon Repairs 5s. shares. Gloucester Wagon 10s. shares eased from 11s. to 10s. 9d., but North British Locomotive firmed up from 6s. 9d. to 7s. 1½d., Charles Roberts 5s. shares remained at 9s. 3d., while Beyer Peacock 5s. shares at 6s. 9d. compared with 6s. 10½d. a week ago, but elsewhere, Birmingham Wagon recovered from 28s. 3d. to 29s. 6d. G. D. Peters have been marked up from 13s. 9d. to 15s. 7½d. Westinghouse Brake held steady at 41s. 1½d.

There was a better trend in the electrical section, A.E.I. at 44s. 6d. improving 1s. 3d.

on the week, while General Electric and English Electric were both 33s. 9d. Crompton Parkinson 5s. shares rallied from 10s. 9d. to 11s. 4½d. on further consideration of the results which showed that profits were maintained in a difficult year, and the 12½ per cent dividend was earned more than twice over.

After their recent sharp decline, Pressed Steel 5s. shares have rallied from 26s. 6d. to 27s., and Dowty Group 10s. shares from 35s. 3d. to 35s. 9d. In response to the raising of the dividend from 17½ per cent to 22½ per cent, Broom & Wade 5s. shares moved up from 23s. 1½d. to 23s. 10½d. Moreover, John Holroyd, 5s. shares were 14s. following the increase in the dividend from 10 per cent to 15 per cent. Vickers firmed up to 29s. 4½d.

OFFICIAL NOTICES

SENTINEL Steam Locomotive 100 H.P. wanted. Write Box RG.877 c/o Hanway House, Clark's Place, E.C.2.

MASTER MECHANIC for railway operating Peru. Minimum five years apprenticeship in steam railroad shops and five years practical experience with diesel-electric traction essential. Age 30/40 years. Initial contract 33 months, free passage out and home. Healthy mountain climate. Salary U.S.\$500 monthly. Box 86, *The Railway Gazette*, 33, Tothill Street, S.W.1.

Foreign Employment ROADMASTER

ENGINEERING GRADUATE preferred; minimum of two years engineering training essential.

Require two years varied railroad engineering service, or five years in direct charge of track crews. Will supervise 135 men maintaining 45-mile railroad assign work, order materials, be responsible for safety, make regular detailed inspections of roadbed and all track on main line, sidings and yards, bridges, tunnels, etc. Will make engineering calculations relating to maintenance and use of structure and equipment. Must speak Spanish. Married or single candidates acceptable.

Excellent opportunity large copper company, Chile, South America. Two year contract with transportation both ways for you and family. Basic salary \$525.00 to \$650.00 per month depending upon age and experience of applicant.

Box 6, *The Railway Gazette*, 33 Tothill Street, S.W.1.

ADMINISTRATIVE OFFICER

REQUIRED by the GOVERNMENT OF NORTH BORNEO Railways Department on contract for one tour of 2-3 years in first instance. Salary scale (including inducement pay) equivalent to £1,218, rising to £2,268 a year. Child allowance, £75/140 a year. Gratuity at rate of 15 per cent of final basic salary for each completed month of service. Outfit allowance, £60. Education allowance. Free passages. Liberal leave on full salary. Candidates, preferably 40-45 years of age, must be fully experienced in Railway operating and Commercial methods and practice, part of which should have been gained with an overseas railway. They must also be Corporate Members of the Institute of Transport. Experience as a Railway Traffic Training Officer would be an advantage.

Apply to CROWN AGENTS, 4, Millbank, London, S.W.1, for application form and further particulars, stating age, name, brief details of qualifications and experience and quoting reference M3C/53042/RA.

COUNTY BOROUGH OF BRIGHTON
Assistant Engineer, Volk's Electric Railway
Salary Scale—£825 x 25 (2)—£875.

APPLICATIONS are invited from persons with suitable practical experience to take charge of the operation of this narrow gauge passenger carrying light railway, including track laying and maintenance, and the operation and maintenance of cars and electrical equipment.

The post is superannuable and subject to medical examination. Conditions of service are those for the Miscellaneous Divisions of the National Joint Council for Local Authorities.

Further details of the appointment and schedule of duties obtainable from me. Applications, stating age, qualifications and experience, and the names of two referees, should reach me by December 10.

Canvassing in any form will disqualify.

W. O. DODD,
Town Clerk.

Town Hall, Brighton
November 16, 1960.

